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How to preserve heal

# RECAP

# HOW TO PRESERVE HEALTH

BY

JOHN BARKAY M.D.

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# HOW TO PRESERVE HEALTH.

BY

LOUIS BARKAN, M. D.

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1890.



# OPINIONS OF DISTINGUISHED PHYSICIANS.

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FORDYCE BARKER, M. D., *Professor Bellevue Medical College, N. Y.*

\* \* \* I regard your book, "How to Preserve Health," as the most sound, sensible, and useful book on the topics which it discusses that I have met with. I wish it could be in the hands of every intelligent head of a family and in the library of every school, for I think it would popularize a vast amount of important and useful knowledge, and thus be of great service to the community. I am particularly pleased with one feature of it: that it does not profess to teach dosing and drugging, which our anxious grandmothers and others lacking the requisite elementary knowledge are too prone to indulge in, and oftentimes do great harm thereby. I congratulate you on the wisdom and success of this effort.

PAUL MUNDE, M. D., *Professor of Gynæcology, New York Polyclinic.*

\* \* \* Your plan of imparting useful knowledge about the preservation of health to the laity, from a medical standpoint, strikes me as decidedly novel and exceedingly practical, and I predict for your book a popularity which I think it heartily deserves. It is excellent reading, and brings before the people many topics of every-day life which are not usually touched upon in popular works, and which everyone ought to know something about. I congratulate you on the successful accomplishment of your task.

W. OLIVER MOORE, M. D., *Prof. of Diseases of the Eye and Ear, N. Y.*

\* \* \* I am sure that all who read your book are to be helped, and find something of interest and profit.

T. MITCHELL PRUDDEN, M. D., *Professor College of Physicians and Surgeons, New York.*

\* \* \* I have found your book extremely interesting, and admire the skill with which you have brought together such a wealth of important facts. It seems to me that you have steered most wisely among the many shoals of popular instruction in hygiene. The book will, I am sure, do much good.

D. B. ST. JOHN ROOSA, M.D., *Prof. of Diseases of the Eye and Ear, N.Y.*

I take my first opportunity to thank you for your book, and to assure you that I have read it with pleasure and profit.

LOUIS A. SAYRE, M. D., *Professor Bellevue Medical College, N. Y.*

I have read your book with great pleasure and profit. If the instructions therein given could be universally disseminated and followed, it would be of inestimable value to the community.

ANDREW H. SMITH, M. D., *Professor Bellevue Medical College, N. Y.*

\* \* \* I think your book well fitted to convey to the general public information of the utmost importance to them, and I trust that it will have a wide circulation.

SAMUEL SHERWELL, M. D., *Prof. of Diseases of the Skin, Brooklyn.*

\* \* \* Your excellent treatise, entitled "How to Preserve Health," appears to me admirably adapted for the reading of the laity, correcting as it does a large number of false impressions that prevail among them. The direct suggestions, as in remarks on the Skin, are of decided value.

ALEXANDER T. C. SKENE, M. D., *Prof. of Gynaecology, Brooklyn.*

\* \* \* I have read your book with great interest and profit. You have rendered the people and the medical profession a great service. I feel confident that your book will meet with the success it certainly deserves.

GEORGE REULING, M. D., *Professor of Diseases of the Eye, Baltimore.*

\* \* \* Your valuable book fills a decided chasm in our literature.

WILLIAM H. WELCH, *Professor Johns Hopkins University.*

Your work seems to me to contain much valuable and correct instruction, and I regard it as superior to most similar popular works.

NIC. SENN, M. D., *Prof. of Surgery, Rush Med. College, Chicago.*

I thank you for your kindness in sending me a copy of your most valuable and interesting book. It is the best book on the subject I have seen, and reflects great credit on you as a writer on popular medicine.

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## OPINIONS OF THE PRESS.

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The *New York Sun*, March 8, 1890:

An excellent popular treatise, which in no way intrudes upon the province of the legitimate practitioner of medicine, is Dr. Barkan's "How to Preserve Health." It is replete with common sense notions, clearly and forcibly expressed, and may fitly supplement the functions of the family physician, who would doubtless cordially recommend it to his patients.

The *New York Press*, March 9, 1890:

The writer of the useful hand-book, "How to Preserve Health," gives in a straightforward and untechnical style much valuable advice on the simple laws of health. \* \* \* This work is suited to the popular needs, being printed in large and clear type and sold at a low price, while containing in brief and pithy sentences a fund of valuable advice and information. Dr. Barkan's views may conflict here and there with certain venerable theories and practices, but they are undoubtedly based on scientific truth and common sense.

The *New York Herald*, April 20, 1890 :

"How to Preserve Health" is a simple, sensible handbook of health. \* \* \* Many books of similar purpose are already in the market; this new one seems as good as any and much better than some of them."

The *New York Journal of Commerce*, March 3, 1890 :

"How to Preserve Health" is the title of a plain, practical work by Dr. Louis Barkan. It is a very simple treatise on the laws of health, and is far better adapted to family reading than a mere scientific work. Its rules for the care of health and the treatment of disease are free from technicalities and easily understood. It is adapted to all ages and conditions and a valuable addition to the library.

The *Mail and Express*, New York, April 3, 1890 :

\* \* \* The different chapters take a wide range of subjects bearing on the ends in view, and Dr. Barkan's suggestions upon all of them are eminently judicious and valuable. The book, which has been commended by the highest medical authorities, is an excellent one for the household.

*Hall's Journal of Health*, New York, April, 1890 :

"How to Preserve Health" is a manual of hygiene for both sexes, which extends from infancy to old age, and treats of almost every ailment that flesh is heir to in a plain, straightforward manner, without the use of technical words and obscure phrases, hence it is admirably adapted for a family guide. The subjects are well arranged, and if the advice given for preventing the inroads of disease are followed, there will be little need of calling in the family doctor.

The *Sanitarian*, New York, April, 1890 :

"How to Preserve Health" is an excellent summary of the most healthful conditions, devoid of all technicalities, and eminently practical in the use of universally available means promotive of health and longevity.

The *Observer*, New York, April 24, 1890 :

The subjects treated are many, but the advice given on all is wise and helpful. Dr. Louis Barkan has displayed a great deal of skill in his arrangement of the book, and it will be an invaluable help in the household where it is used.

The *Golden Rule*, Boston, April 10, 1890 :

"How to Preserve Health" is a sensible, plain, unexceptionally wise manual to instruct readers what to do that they may preserve and enjoy health and avoid sickness. \* \* \* With the purpose, style, and contents of this book we are pleased. It seems safe and trustworthy, and carries the promise of much usefulness.

The *Examiner*, New York, March 13, 1890 :

"How to Preserve Health," by Dr. Barkan, commends itself as a sensible and simple treatise that does not by any means attempt to make every man his own doctor, but rather shows him how he may measurably avoid the necessity for "doctoring" altogether. Most of the ills that flesh

is said to be heir to are preventible, and books like this tell how to prevent them. If men and women would read such a book before the mischief is done, and profit by what they read, the race would be healthier.

The *School Journal*, New York, March, 1890:

"How to Preserve Health" seems a good book to have at hand. Most persons neglect their health in one way or another, but most persons, as Carlyle said, are fools. This book is meant to remove one kind of foolishness.

The *Turf, Field and Farm*, New York, March 28, 1890:

"How to Preserve Health" is the title of a plain, common-sense-like book. Whoever complies with the hygienic and dietetic rules laid down with clearness will enjoy better health, and life, it stands to reason, will be prolonged.

Other favorable reviews have been published by the *Christian Advocate*, the *Christian at Work*, the *Church Union*, *Munsey's Weekly*, etc.

## PREFACE.

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THE author of this work has labored with the object of giving to the public an available handbook of hygiene and sick-room assistance, founded upon the most recent developments in medical knowledge. Through this medium it is designed to bring the reader into closer accord with the aims and methods of the physician.

To preserve health of body and integrity of mind both in the individual and in communities is an object worthy of the supreme endeavor of every human being, for upon these depends our own prosperity and that of our offspring. A task so important may be thought to represent the focus of our endeavor, about which all other effort radiates to a circumference of true happiness and prosperity.

He whose taste runs to quackery and old women's gossip will find little satisfaction in this book ; but he who is accessible to the voice of reason, to science, and to a ripe experience, cannot fail of be-

coming an apostle to its teachings. In this belief the author is content to submit his production to the considerate interest of the public.

In conclusion, he would offer his sincere thanks to the authors whose papers, by permission, he occasionally quotes, and to their publishers, Messrs. William Wood in New York and Lea Brothers in Philadelphia.

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# INTRODUCTION.

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As every man is in a measure the master of his own fate, he is also, to a great extent, the master of his health. Wisely and intelligently to make use of his liberty and individual rights, he must overcome many prejudices; and this is equally the case in regard to his health. In order to understand what is really needful to a full enjoyment of health, and in order to understand the great importance of early medical assistance in cases of necessity, one must uproot various old prejudices and abandon bad habits.

The author of this little volume proposes to instruct his readers what to do that they may preserve and enjoy health and avoid sickness, in so far as human foresight can accomplish these ends. It is not intended, however, to advise them how to treat themselves in case of sickness, for the writer believes that, so soon as unmistakable signs of disease are perceived, a physician should be called.

The only exceptions are cases of emergency, especially where there is danger to life. These will be fully and extensively treated, and intelligent advice will be given. The author would think of advising even an educated layman to treat himself as little as he would of putting a loaded pistol into the hands of a child.

By carefully studying this book and by complying with the hygienic and dietetic rules herein laid down, the reader will be able to preserve his health and prolong his life. The author is very well aware of the fact that the rules of hygiene are insisted upon by every sensible physician; but he also knows very well how frequently they are disregarded and forgotten.

A good physician recognizes the value of intelligent obedience in his patients, and the exact fulfillment of his directions gives him satisfaction nearly equal to that which attends good pay for his services. It is accordingly the author's intention to impress upon the reader the necessity of living up to the wishes and advice of his physician.

## PART FIRST.

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### THE PREVENTION OF DISEASE.

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IT is easier to prevent disease than to cure it. To this end we must, of course, know the conditions necessary for the possession and preservation of health.

The agencies and influences to be spoken of in this connection are air, water, food, light, and the other forms of force and matter which determine the change of tissue in the human system. Beside these is the influence of environment, varied by individual circumstances, such as climate, soil, weather, habitation, occupation, and clothing.

Health as well as disease may be inherited by children from their parents. The importance of conforming to the rules of hygiene must not, therefore, be judged merely from the individual standpoint. Such conformity will be valuable not only to parents, but also to their offspring for generations, and, if

universal, will enable us, we may claim, gradually to improve the whole human race.

The first important principle by which he must be governed, who wishes to enjoy a long and healthful life, is that of securing a normal and regular continuance of tissue-change throughout his body. This **Tissue Metamorphosis**, as it is called, consists in the constantly proceeding waste of tissue and its regeneration. That these may progress freely, the following rules must be complied with:—

1. To furnish a sufficient supply of normal, healthy blood, the **Food** taken must be wholesome and abundant, and the air inhaled must contain the required amount of oxygen, while those constituents of the blood which represent the unavoidable tissue waste must be readily and constantly eliminated.

2. The **Circulation of the Blood** must be free and rapid, so that it may constantly pass through all parts of the body, in order that tissue waste may be eliminated, and that new matter may be distributed to the tissues in need of it, where new constituents are ready to be taken up.

3. Activity must alternate with rest in order to maintain tissue change and regeneration at the proper standard, and an equable temperature is required for the same purpose. The desired **Regeneration of the Blood** is very frequently interfered with by improper food and eating, and, more par-

ticularly among the poorer classes, by an insufficient supply of food. The same holds true as to the quality of the air inspired. The loss of heat occasioned by bodily labor on the one hand, and by cold, during winter and in cold climates generally, on the other hand, must be made good by a larger supply of food.

## F O O D.

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Every article used as food is made up of organic (vegetable or animal) or of inorganic (mineral) matter, and should contain all the various constituents of the human body in such form that they may be readily changed into living flesh, bone, and other tissues. The most digestible food is that which can be easily acted upon by our digestive organs, and thence absorbed with facility by the blood. Some kinds of food are very nourishing, but very hard to digest; while, on the other hand, matter that is easily digestible is not necessarily nourishing. Digestibility is greatly influenced, also, by the manner in which food is prepared or partaken of. For instance, Meat will be more easily digested when it is well cooked and thoroughly masticated. So, also, beans, lentils, and peas are more easily digested when strained. The more important articles of food are water, albuminous substances (white of egg, meat, etc.), fatty substances and carbo-hydrates (sugar, starch, etc.), table-salt, and the salts\* of lime, sodium, and

---

\* Salts are compounds, containing one or more of these substances combined with an acid.

iron. Animal substances, especially when taken in a soft, pulpy form, are more easily digestible than vegetable substances. **Spices and Condiments** do not contribute anything toward building up the tissues of the human body : they only serve to improve the taste of the food and to promote digestion by increasing the flow of the digestive fluids.

Food is the more digestible, the more soluble it is in the **Digestive Fluids**. The latter comprise the saliva, the gastric juice, the bile, the pancreatic juice, and the intestinal secretions. Therefore, water, sugar, and the blood salts will be the most rapidly taken up into the blood ; albuminous matter, if finely cut up and of soft consistency, will be more easily digested than when taken in more solid form ; small pieces of fatty matter more easily than fat in large lumps ; the flesh of young animals, or well cooked meat, more easily than tough meat, meat from old animals, smoked or salted meat.\*

**Digestion** is accelerated by an increased flow of the digestive fluids. Thus, starchy substances will be better digested when the flow of saliva is increased ; albuminous substances when the gastric, pancreatic and intestinal juices flow freely; while the bile, pancreatic and intestinal juices must increase in quantity for the rapid digestion of fats.

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\* There is one exception : veal is digested much more slowly than beef.

An essential point in this connection is the ability of the digestive fluids to permeate the food. Thus, if food is surrounded by some substance impermeable to aqueous liquids, as, for instance, fatty matter or the skin of certain vegetables, it is difficult of digestion. Porous matter is digested much more quickly than more compact substances. It is for this reason that bread which has not raised well is harder to digest than when properly raised, hard cheese is more difficult of digestion than soft cheese, fat and greasy food than moderately fat food, and food incompletely chewed than that which has been thoroughly masticated. Food, furthermore, is easier to digest the more nearly it resembles in its composition the components of the human body: therefore animal is more easily digestible than vegetable food.

Those races which live on **Vegetable Diet** principally are not powerful, but are of a mild disposition and apt to become enslaved, while races which prefer an **Animal Diet** are warlike and jealous of their liberty. History teaches us beyond contravention that those nations which have accomplished most in the course of time are those which have lived upon a **Mixed Diet**. Life in the temperate zone, in which the races most advanced in civilization dwell, peremptorily demands a mixed diet; agriculture and the tending of cattle are both favored by its conditions. In hot climates, on the other hand, a ve-

table diet is preferable ; while in the frigid zone an animal diet is the most suitable.

**What to Do before or after a Meal** is a question of great importance so far as digestion is concerned. Thus, it is advisable to shun bodily or mental exertion immediately before eating, and weak and anæmic persons may even take a short nap with advantage just before sitting down to table.

The table should be set in a light, airy room, moderately heated, while the mental atmosphere should be one of quiet and happy relaxation. No pressure should be allowed, over the region of the stomach especially, from tight lacing, belts, or other constrictions. Solid food, meat particularly, should be cut up into small pieces and well masticated. It is best to eat slowly, and to drink now and then, as required. Drinking during meals is hurtful only when too much liquid is taken, or when fluids are drunk along with fatty substances.

Digestion is promoted by the use of condiments and mild stimulants, such as tea and certain kinds of **Wine**, in moderate quantities. Clarets, genuine sherry and genuine port wine contain the mineral salts of the blood in proper proportions : they are therefore not only stimulants, but actually nutritious. If taken in excess, however, they inevitably prove injurious.

Warm meals are as a rule easier to digest than

cold ones, but extremes must be avoided. Too hot or too cold substances are always injurious to the stomach, alternation between the two especially so.

A short Nap after meals is strongly to be advised: bodily or mental exertion, at least, should never be attempted at this time. Professor Hyrtl has proved that the old view, according to which bodily exercise was recommended to follow eating, is erroneous. He fed two dogs of equal development with equal quantities of the same kind of food, and found, upon making autopsies, that the dog which had remained quietly at home had digested his meal much better than the one which had been on a lively run for several hours succeeding the meal.

This after-dinner nap is especially to be recommended to persons who have been very active up to meal time, and also to those suffering from anæmia or nervousness. It should not last longer, however, than from half an hour to an hour : sleeping too long will retard digestion. For the latter reason it is not advisable for those who live a sedentary life to partake of a full meal shortly before retiring for the night. Sleeping too long with a full stomach, aside from the above considerations, frequently proves disagreeable by causing bad dreams and a feeling of oppression.

**The Number of Meals and the Selection of Foods**  
must be determined with a view to such consid-

erations as the age, the sex, and the constitution of the individual, the state of his health, his mode of life, the climate in which he lives, the season of the year, and the time of the day. It must not be assumed that a single article of food, not even milk, will suffice for every constitution, every age, and every occupation ; this is not to be thought of. The kind of food must change with the systemic condition of the individual.

In general, experience and habit will enable us to determine what kinds of food and drink will best agree with us. During the period of growth, a process dependent upon the new formation of tissues in excess of the tissue waste which is constantly going on, the child needs a very nutritious, but mild, non-stimulating diet. At this age, meat and fats are especially suitable. In adult life, when there is an equilibrium established between waste and supply, the diet must be regulated accordingly. In advanced life, when waste is in excess, a light diet of easily digestible and slightly stimulating food is indicated.

**The Cost of Food** is not always in proportion to its nutritive value. The earlier fruits and vegetables of the season do not possess great nutritive value in spite of their high price. On the contrary, they exert a harmful influence upon nutrition, especially in the case of persons with poor digestion,

since they exclude more desirable food from the stomach. On the other hand there are many articles of diet of great nutritive value which are comparatively cheap, such as eggs (in summer especially), milk, leguminous vegetables (dried peas, beans, and lentils), certain kinds of fish, and certain portions of animal food (the kidney, the liver, the marrow, the sweetbread).

In some countries, as in America, fishes' heads are given or thrown away, while elsewhere they are considered a delicacy. In the same way fish roes, which are very nutritious, are mostly neglected, while in Austria they are utilized in the preparation of an agreeable bitter soup. In Austria, southern Germany, France, and Switzerland good prices are paid for the spleen, the brain, the lungs, and the udder of the cow, while in the northern countries of Europe these portions of the animal are not partaken of, even among the poor. Leguminous vegetables are used as an article of food very generally throughout Europe, while in our country they form a less frequent article of fare—a fact not at all to our advantage. Jews and Mohammedans are very fond of calf's and sheep's pluck and of tripe, viands of which Christian peoples make little use.

Still wider **Divergencies** exist in the matter of **Taste**, as we may see from the following list of extraordinary nutriments :

The Patagonians in South America and the Kirghis and other races in Central Asia prefer horse flesh to any other. That which they enjoy tastes, of course, much better, and is far more tender than that to which the poor in European cities are accustomed, inasmuch as they choose younger animals for slaughter. It may not come amiss to remark here that in time of war, when provisions are frequently to be obtained only with the greatest difficulty, the flesh of horses killed in action might be advantageously utilized as food for the soldiers.

Italians, it is said, hold cat meat in high esteem ; and many persons, not improbably, are accustomed to partake of our feline pet under the guise of roasted hare, more especially in such larger cities of the Continent as Paris and Vienna.

The Chinese are given to fattening dogs for their table ; they dote on shark's fins and rat stew. In some tropical and sub-tropical countries monkeys, lizards and snakes are considered delicacies, even by Europeans living there ; and among the civilized nations of Europe and America there are some gourmands who like to see young crows, frogs and snails on their bill of fare. Soup of may-bugs, old Gorgonzola (cheese swarming with mites), and even skunks are enjoyed by some. The latter, of course, must be killed unawares. The Abyssinians cut a steak from the living ox, whose wound, immediately

covered again by the skin previously reflected, heals rapidly in the pure atmosphere of the high plateaus. In Africa, the fair young belles of the Gallas tribe tie a silken thread about a cow's neck, puncture one of the swollen veins, collect the blood in vessels, and offer it while still warm for the refreshment of their swains. The Chinese prefer eggs containing a partly hatched chicken. Arabs and Indians like fried locusts. The Botocudes on the banks of the Amazon swallow caterpillars, ants and their eggs, or rather chrysalises, as delicacies. The Otomakes of the Orinoco eat a certain kind of earth or clay, probably impregnated with organic matter. The Esquimaux cut off comfortable strips from a seal, and with matrimonial tenderness assist its ingestion by alternately pushing the pieces down one another's throats, finishing the meal with a copious draught of whale oil.

In reading of these strange preferences we may smile or shudder, as the case may be; and yet it is all a matter of habit in educating the taste in certain directions, which we are apt to call perverse, because they are not quite in accordance with our own taste. This is best illustrated by the fact that some articles of our diet are shunned by other races. Thus, it is reported that the Garrows and the Nogas, some semi-civilized tribes in Farther India, and also the inhabitants of Cochin-China, detest the milk of

animals as an article of food, and deem it absolutely impure. The Kafirs avoid fish, the Hindoos fish and meat; and two hundred and fifty millions of Mohammedans, as well as ten millions of Jews and at least forty millions of other people, belonging to various races and religious sects, refuse pork or meat of every kind.

**If Too Much Food** is ingested, it is of importance whether this happens only occasionally or whether it is done frequently and repeatedly. In the latter case the polyphagia, or over-feeding, may become a habit. This, in turn, will cause derangement of the digestive organs, if the food is hard to digest. Such troubles are principally referable to the liver, in consequence of stagnation of the blood in the portal system. Piles are also produced by the same cause. Some of the ill effects of over-feeding may be counteracted, to a certain extent, by exercise in the open air.

**The Temperature of the Food** is of great importance. Although the effects of smoking viands may be modified in some degree by eating bread, especially stale dry bread, between times, it is best not to partake of very hot or very cold substances, for these are liable to cause inflammation of the mucous membrane of the mouth, throat, oesophagus, and stomach, or even dangerous and lasting contraction of some portion of the alimentary tract. The teeth also suffer severely from the same cause. It is

not wise to add irritating substances, such as strong spices, in large quantities to the food ; nor should strong liquors be consumed during the meal, if at all, inasmuch as they injure the stomach and impair digestion for a long time afterward, and the habit of their use, if persisted in, leads to organic disease of the stomach, the liver, and the digestive organs generally.

**Preparation of Food.**—Aside from its natural condition, the digestibility and the savouriness of food is greatly influenced by the manner of its preparation. If fruits or vegetables are to be eaten raw, they should be ripe, verging toward fermentation. If cooked, ripeness is not essential, because cooking or steaming, when thoroughly performed, amounts in a certain sense to artificial ripening. Vegetables which are insufficiently boiled in salted water, according to the English and American custom, have hardly any nutritive value. In order, for instance, to render beets and carrots digestible, nutritious, and at the same time delicious, they must be thoroughly boiled or steamed in true Continental style, that is, for a long time, and with the addition of butter or lard, parsley, or other condiments, or, better still, together with a nice piece of meat, preferably lamb or mutton. The same is true of the condition in which meat should be considered fit for cooking. Ripeness bordering on Fermenta-

tion is obtained by exposing meat for several days to the air, and especially to the crisp air of winter. The savouriness of game, in particular, is greatly enhanced by this means.

When the process of fermentation is carried too far in cereals, light or heavy spirits result, while the checking of this process at a proper time develops all the constituents of the grain to their highest degree of nutritive value, as we find in malt extracts. Almost every country has its peculiar drinks as well as its peculiar cookery. The South Americans like their "pulque," the southern Slavs their plum spirits, the Russian peasantry a common soup called "borsts," which is a very mild and agreeable product of the fermentation of cabbage, beets, or bran.

As many a genial mind lives in obscurity, so also many culinary arts and specialties thrive for a long time unthought of and unknown by the more civilized nations. Thus, the inhabitants of the Balkans do not know that they possess delicious wines, and that they understand how to cook cabbage, rice, and beans in an incomparable manner. On the other hand, the Morlaks and Dalmatians of the mountains do not dream that they commit an offense against the æsthetic sensibility of a refined palate, when they bury milk in a pit for the purpose of allowing it to become cheese.

## FATTY SUBSTANCES AND THE CARBO-HYDRATES.

Fatty substances and the carbo-hydrates are to a certain extent the heat producers of the human body, while **Albuminous Matters** may be said to build up its machinery, the muscular system. Since the work of a muscle is performed by the combustion of substances rich in carbon, a large amount of such substances, in the form of fat, sugar, and the starchy foods, should be eaten by those who do laborious work. As, from the different portions of a steam engine small particles of iron and other metals are continually rubbed off by use, and repairs are thereby made necessary in course of time, so in the human system the albuminous substances which compose the muscular apparatus are gradually consumed and albuminous food must be eaten to replace them.

The fatty substances which we add to our food, such as butter, lard, and oil, do not merely serve as nutriment, but play also an important part in the production of heat and muscular power. It has been established by experiment that starch is converted more easily into sugar when it is taken together with fatty substances than when eaten alone. Sugar, syrup, honey, and like substances, serve not

merely to improve the taste of food, but, like starch, are utilized as nutriments and heat producers, being hydrocarbons in composition. Sugar is much more easily digested than starch. It also increases the flow of the gastric juice, although it interferes with digestion, if large quantities are consumed. It also accelerates the digestion of albuminous substances and of those containing iron and lime, by its conversion into lactic and butyric acid while passing through the intestinal canal; and it leaves the body at last, decomposed into water and carbonic acid, principally through the lungs.

**Iron** is a constituent of many articles of diet and also of some beverages. It has been proven that more iron is ingested in this form than the human body requires, since some of it passes out of the body unused with the excretions.

**Water and Common Salt** are the two inorganic substances which must be taken in large quantities in order to render healthy nutrition possible. Fully three-fourths of the body consists of water, and salt is a constituent of all its solid and liquid components. But water and salt are not contained in sufficient quantity in the various animal and vegetable articles of food, and therefore we are compelled to salt our food and drink water freely.

The most important function of water in the animal economy depends upon its property of dissolving

numerous substances. The water of springs and rivers always contains solid and gaseous matters of various sorts, and our drinking water sometimes furnishes us a sufficient quantity of some of the inorganic matters. Certain mineral waters, especially those containing iron, may therefore act as nutrients or may exercise a curative influence.

The following requirements must be fulfilled in order that a water may be both palatable and healthy : It should be clear and colorless like crystal, even after standing for some length of time ; it should show little beads of gas, air, and carbonic acid ; it should be almost free from organic substances and the products of their decomposition, namely ammonia and nitric acid. The presence of micro-organisms and of the products of decomposition in drinking water is frequently the cause of diseases like cholera and typhoid fever. Water obtained from wells in the vicinity of sewers, surface drains, cesspools, cemeteries, and manufactories should especially be avoided, as it is likely to be contaminated from these sources. By providing a pure water supply the sanitary condition of a town or other community may be greatly improved and much sickness averted.

The simplest means of purifying water is by filtering it. For this purpose the best substances are charcoal, or a combination of clay and charcoal, be-

cause this material has the property of separating from the water all impurities, especially those decomposed materials which give it a bad smell and taste. An inexpensive but thoroughly effectual filter may be constructed in a flower pot, by lining it with a layer of flannel, and then filling in successively three inches of gravel, three inches of white sand washed perfectly clean, and four inches of animal charcoal. A clean sponge may then be placed across the top. Such methods are similar to that followed by nature, where the earth keeps back all or most of the germs and impurities contained in water which percolates through it.

Formerly it was believed that ice could not possibly contain the germs of disease. But Dr. T. Mitchell Prudden of New York has shown that ice, Hudson River ice, for instance, contains almost all those bacteria in an active state, which were originally present in the water. For this reason it is not desirable to put ice in drinking water. When cold water is craved (although cold water really interferes with digestion), it should be boiled and filtered and cooled in bottles on ice.

**Milk** might well be called white blood, since it resembles blood so much in its composition. It is the only article of food which, when taken alone, will support life. This it does because it contains about thirty-three per cent. of blood-forming mate-

rial, including all those elements which go to build up the human frame.

Human milk is of a bluer white than cow's milk, and has a sweeter taste: it does not turn sour as rapidly as other milk, and it does not form such thick and compact curds: it is much richer in milk sugar, but contains less caseine (the cheesy material of the milk), butter, and mineral salts than cow's milk. Ass's milk resembles human milk very closely. Goat's milk is very rich, but does not taste well: this may be remedied by mixing cow's milk with it. Sow's milk is also said to be very nourishing. In order to render cow's milk as nearly like human milk as possible, water, milk sugar, and a little table salt should be added. Whether it is true, as has been stated, that the milk of dark-skinned women is richer in caseine, butter, and sugar than that of light-complexioned individuals, our evidence is inconclusive. We may mention in this connection that virgins, as well as men, have been known to nurse infants upon the milk of their own breasts.

It has been proved beyond doubt that such diseases as consumption, typhoid and scarlet fevers, may be communicated through the agency of milk. It is, therefore, an imperative duty to boil milk before using it, unless it is known to have come from a single healthy cow. The addition of sodium bicarbonate, in the form of baking-soda, or of mineral

water containing this substance, seems to render the caseine of milk much more easily digestible: the same result is reached by skimming the cream from the surface after standing for some hours. When drinking milk, it is advisable to take small mouthfuls at a time, and to eat bread with it: by this means the curds of caseine, which are always produced by the acidity of the gastric juice, are prevented from forming in large lumps in the stomach. Milk cannot be said to be easily digestible, but it is one of the most nourishing articles of food, especially when it is rich in butter and caseine.

**Meat.**—Carnivorous are superior to herbivorous animals, as far as muscular power and the rapidity of movement are concerned. In the same way, we find that races who live on a meat diet principally are superior to those preferring a vegetable diet, in muscular energy and nerve power, as well as in power of endurance.

This superiority of persons living on a meat diet is illustrated, for instance, when we compare an American workman with a Chinese coolie, or English sailors and soldiers with those of India, who live on rice and a vegetable diet exclusively. Working men whose diet comprises plenty of meat are able to accomplish a larger amount of work in a given space of time than those who consume principally vegetables. Persons who have to do a great deal of

mental work know very well that a meat diet is of far greater benefit to them than a vegetable one.

There is a great difference, not only in the flesh of different species of animals, but even in that of different animals of the same species. Animals which do laborious work during life furnish hard, tough, and indigestible meat, the muscular fibres being plentiful in proportion as the fat is diminished in quantity. The mode of killing exercises an important influence upon the quality of meat. The flesh of animals which have been chased to death, for instance, develops a peculiar and very agreeable flavor, due principally to the formation of lactic acid; but it will not keep, because of the presence of this acid. On this account it is best to allow animals to rest for twelve or twenty-four hours before being slaughtered; the meat will then be much slower in decomposing.

A very pale color in meat is a sign that the animal was poor in blood and that the meat is wanting in nutritive qualities: the cause of the bloodlessness may even have been some serious disease. A deep reddish purple color shows that the animal has not been killed, but that it died a natural death. A marble-like appearance, produced by layers of fat interposed between the fleshy fibres, is possessed by none but good meat. The fat in healthy meat is white and hard, but that of diseased meat is yellow-

ish, soft, watery, or jelly-like. Good meat feels solid and scarcely moistens the finger, but diseased meat is soft and exudes fluid. Good meat has no odor; diseased meat smells tainted. Good meat shrinks only slightly in cooking and loses but little in weight; while spoiled meat shrinks and becomes lighter, because in disease fat and muscle substance are consumed.

The mode of preparing meat for the table is of great importance. It will be more nutritious and more easily digestible, the more carefully it is prepared; and, moreover, the thorough cooking of meat destroys any germs or parasites which it may contain. It is important that the blood should remain in the meat. This end can best be fulfilled by exposing a piece of meat suddenly to a high temperature, causing the albuminous substances contained in the external layers to coagulate, so that the blood cannot run out. To do this, roast the meat in a very hot oven, at the same time pouring over it frequently hot fatty gravy, which will form upon it a fragrant brown crust. In making strong broth or soup, however, the best plan is to put the meat on the fire in cold water; the juices of the meat will then mingle with the water gradually while it is being heated.

Eggs are, next to milk and meat, the most nutritious and easily digestible food, especially when well cooked and well masticated. They contain, like

milk, some portion of each of the substances which go to form the human frame, and are transformed into blood very quickly.

Fish roe, caviar, the eggs of turtles, and even those of alligators are used as food, the latter only by some Indian tribes on the banks of the Orinoco ; most frequently, however, the eggs of birds and more especially those of the domestic fowl are used. It is said that duck eggs are still more nutritious than the latter, while a duck is said to lay more eggs than a hen, although consuming no larger amount of food. Addled eggs are found to be wanting in transparency when "candled," and are so light as to float upon a ten per cent. solution of common salt, while fresh eggs, which contain no putrefactive gases, will sink.

It seems to be established theoretically that the white of a hen's egg is equally soluble in the gastric juice whether coagulated or only soft boiled. The rapidity of its assimilation, however, is found to depend upon the size of the pieces of coagulated material.

The same is true of **Cheese**. The more fat it contains and the harder it is, so much the more difficult is it to digest. Thorough chewing increases its digestibility. Old cheese contains certain fatty acids which act similarly to strong spices, increasing the flow of the gastric juice. It should therefore be

eaten in small quantities as the last dish of a full meal.

Cheese contains more albuminous matter than any other food. At the same time its chemical constitution is such as to ensure the highest degree of nutritive efficiency. One-third of its weight is composed of albuminous matter, mostly caseine, while the remaining two-thirds consists of butter, milk sugar, and other constituents of the milk.

Of the various **Cereals** wheat is the richest in vegetable albuminoids : next to it stands rye : then come rice, sago, tapioca, and arrowroot, in the order named. By combining wheat and rye in certain proportions a very palatable bread may be prepared.

**Prime Wheat Flour** should have the following characteristics: When handled none should adhere to the fingers; if a handful be squeezed, it should not sift through the fingers, but should clog together, forming a little ball, which will show the fine lines of the palm for some time after release; if a little ball of flour be dropped on a table, it should even then preserve its form and continuity, at least in large measure. Good flour, although it gives distinctly the sensation of being composed of separate particles, is at the same time soft to the touch. With the blade of a knife it may be spread out on the table in a very thin layer; and, when stirred up with water, the dough will quickly set and become hard. White

flour contains much less albuminous matter than those grades which have a yellowish tint, the purest white flour consisting almost entirely of starchy matter.

To keep flour from spoiling, it should be thoroughly dried and stored in bags, not in barrels. It is said that the exclusion of air is apt to render flour somewhat damp and does not yield as good a dough as when the flour remains perfectly dry.

Good **Bread** will not have a sour taste. It must be prepared, of course, only from good flour. It should not show little patches of uncooked flour, the small cavities due to gases generated in the raising should be evenly distributed, and there should be no large cavities nor areas where none exist. The layer directly beneath the crust should not be streaky, and the crust itself should not be black and burned, for this gives a bitter taste: the crust should, on the contrary, be brown, and its taste wholesome.

Bread which contains much albuminous matter (that is, bran) is more nutritious; but that which is light and which contains less bran is more digestible and entails but little labor upon the digestive apparatus. Newly baked bread is less easily digested than bread which is a day or two old, for the latter is more readily penetrated by the digestive fluids. Sick people, therefore, and especially those suffering

with affections of the stomach, should confine themselves to the use either of stale bread, or of crackers, zwieback, or toast.

**Leguminous Vegetables**, such as peas, beans, lentils, and buckwheat, are very nutritious because of the amount of albuminoid material which they contain, an amount proportionately larger, in fact, than that found in the cereals, although their composition in other respects greatly resembles that of the latter. The peculiar vegetable nitrogenous principle which is said to contain phosphorus is called legumine. The Chinese, we are told, prepare from peas a certain kind of vegetable cheese.

**Potatoes** are much less nutritious, especially when served in the form of soup or mush, although they are more easily digested. In order to retain the nitrogenous principle they should be thrown into boiling water : the coagulation of the superficial layers prevents the escape of the nutritive elements, and on peeling just before eating the full benefit is derived. Potatoes which have been frozen are sweet, because rich in sugar. They may be used immediately after they have been thawed, but never when there is the slightest sign of decomposition.

Vegetables and fruit in general do not possess marked nutritive value, with the exception of certain varieties of fruit which grow in tropical and

sub-tropical countries, and which contain a large proportion of sugar.

Among **Beverages** certain clarets and sweet wines are of great value in sickness, and still more in convalescence. In moderate doses they are mildly stimulant and quite nutritious, while at the same time they admit of ready assimilation. White wines and champagne serve principally as stimulants. California wines are very serviceable, and are not so apt to be adulterated as are imported wines. For the same reason domestic wines as a rule are the best in every country.

As an article of diet, **Beer** is taken for enjoyment, rather than on account of any nutritious qualities it may possess. In order to be wholesome, it should be thoroughly fermented ; it should have no sediment, and should remain clear and transparent after standing for some time ; it should not taste sour or stale ; its foam should be white and milky, with small bubbles, and should last for a long time.

## THE ADULTERATION OF FOOD.

The adulteration of food always lessens its nutritive value, although not always deleterious to health. But in some instances actual poisons are introduced by manufacturers and dealers, whose presence renders the article, upon habitual use, gradually destructive of life. The following list enumerates some of the more common and harmful impurities, with simple methods for their detection.

**Milk** being a universal article of food, its purity is of the utmost importance. It is chiefly falsified by dilution with water, an impurity which may be suspected from the bluish color and the scarcity of fat-globules, but can only be certified by the lactometer or by other scientific tests.

A small quantity of genuine wheat **Flour** will float upon water, while the particles of rice, meal, and other substances used to adulterate it, sink to the bottom. After baking, the presence of these impurities is indicated mainly by the heaviness of the bread.

**Butter** may be very simply tested for adulterations by spreading a thin layer upon a piece of white paper, rolling the paper into a suitable form, and setting fire to it : if the butter is pure, an agreeable odor will be emitted ; but if it is mixed with animal

fats, the odor will resemble that of burnt tallow. The presence of other adulterations, such as flour, may be detected by spreading a piece of butter the size of a bean upon a well-folded newspaper : the butter will soon soak into the paper, while foreign substances will be left upon the surface.

**Lard** is sometimes adulterated with alum, starch, and lime-water. When pure, it is completely soluble in benzine, has no burnt taste or odor, and melts without sputtering to a clear fluid.

Peas, beans, chicory, rye, and similar kernels, are the chief adulterations used in **Coffee**. They may usually be detected by stirring a handful of the suspected article in cold water, for most of them sink more quickly and color the water less rapidly than the genuine berry.

It should be noted, however, that these impurities are less hurtful than coffee itself. Nevertheless, for the satisfaction of coffee-drinkers, and because it is not to be expected that any large number of these can be persuaded to abandon their favorite beverage, it is well to append certain rules for the detection of coffee-grains compounded artificially from ground peas, cracker-dust, and similar ingredients. Genuine coffee-grains are hard and heavy, and sink quite readily in water. Grains which float upon the surface are of inferior quality. Genuine grains do not absorb water, but remain hard and tough. Whether

the grains are colored or not, may be determined by putting them into hot water, and shaking them thoroughly : if colored, their dye will dissolve in the water, by whose aid a chemical examination of its character may be made. Coffee injured by sea-water may be distinguished from a disagreeable odor about the beans and by their clinging together. Furthermore, beans which have been injured by sea-water may be detected by shaking them in cold water : if the water acquires a disagreeable taste, the coffee has been in the sea, and should be rejected.

**T**ea leaves are best distinguished from those of other plants by careful examination after wetting and spreading them out.

**W**ines are sophisticated chiefly by the addition of alcohol, usually in the form of poor brandy. Champagne, sherry, and other high-priced wines, are not sold in this country without such adulteration. Cochineal and fuchsine, the most harmful coloring matters used, may be detected by evaporating a glass of the wine to one-tenth of its quantity and dipping a piece of white wool into the residue, when the dyes indicated will produce respectively a permanent red or pink color. The coloring matter of a pure wine does not dye wool without a mordant.

Excess of fusel-oil in **B**randy may be ascertained by rubbing a little of the spirit between the palms, and noting whether any odor remains after the

alcohol has evaporated. Good brandy evaporates completely, while the persistence of an unpleasant odor indicates impurities.

**Horse-radish** is frequently mingled with grated turnip, which, however harmless otherwise, is sure to retard digestion.

The **Jellies** of commerce should be avoided. They generally consist of gelatine and apple jelly, colored with poisonous substances and flavored with unwholesome essences to correspond with the labels affixed.

The arsenic, copper, lead, and other mineral poisons often used in the manipulation of confectionery, sugar, mustard, cayenne pepper, pickles, vinegar, tea, beer, and many other articles of everyday consumption, are only to be detected by chemical tests.

In purchasing canned goods it is a safe rule to observe whether the head of the can is concave, a bulging appearance being indicative of decomposition.

## IMPEDIMENTS TO NUTRITION.

When eating or drinking one may accidentally swallow some **Foreign Body**. If sharp or pointed or of pretty large size, this may cause trouble at some point in the digestive tract by producing inflammation, obstruction, or actual injury. It is, for instance, a dangerous habit to swallow the stones of cherries, plums, and other fruits. Many cases of death from inflammation and perforation of the vermiform appendix are on record, which owed their origin to the presence of these foreign bodies.

The young and eggs of tape worms, trichinæ, and other **Parasites** are frequently ingested with certain kinds of food, more particularly with raw and insufficiently cooked meat. These may remain in the human body, and they occasionally give rise to fatal diseases.

The abuse of **Alcoholic Liquors**, especially the immoderate drinking of whiskey that contains much fusel oil, is liable to cause diseases, which will be aggravated by bad or insufficient nutrition and by lack of proper clothing and shelter. The degenerative processes caused in many of the vital organs, and particularly in the liver, by the abuse of alcohol, ultimately lead to incurable diseases and to death.

"With each beat," says Richardson, "the heart expels six ounces of blood. During sleep ten less beats occur in a minute than otherwise. The entire difference in working power during a night of eight hours, therefore, amounts to thirty thousand ounces of blood. If I lie down at night without drinking alcohol, I obtain the rest my heart needs; but if I partake of wine or spirits before retiring, I interfere with that rest, for the effect of the alcohol is to increase the number of heart-beats. Instead of sparing my heart, I have added to its activity by some fifteen thousand more beats. The consequence is, I arise wearied and unfit for the day's work, until I have taken another dram of the strong drink I esteem so highly."

It is, moreover, a fact well known to physicians that hard drinkers have little power of resistance when attacked by disease, and that their illnesses are therefore liable to assume a grave character and to terminate fatally. Drinking people quickly succumb to diseases which under other conditions would have no sinister effect and which but rarely destroy those of temperate habits. The abuse of alcohol even establishes a predisposition to disease, so that hard drinkers are known to fall sick much more easily than others, and very frequently so by a fault of their own. They make no effort to avoid expos-

ure, either to infection, to cold and wet, or to other serious dangers, because their intellect is under the ban of the deadly poison; and at the same time their digestive apparatus is so weakened by this pernicious habit that they are much more readily affected by cholera, dysentery, yellow fever, and other infectious diseases.

The fact is well established that fully one-half of those who become insane bring this calamity upon themselves, either wholly or in part, by the use of alcohol. It is asserted furthermore that children begotten in a state of drunkenness are epileptics from their very birth.

**Tobacco**, whether used for smoking, chewing, or snuffing, acts first upon the nerves of taste and smell, then upon the digestive and respiratory organs, and finally upon the general nervous system. If a portion of the saliva be swallowed while smoking or chewing, catarrh of the stomach may result, and the inhalation of the smoke may give rise to a similar condition in the throat and bronchial tubes. Tobacco should therefore not be used by persons suffering from affections of the stomach or respiratory organs, especially when troubled by a cough. The salivation occasioned by tobacco-smoking is another effect, which, by the constant spitting it induces, more or less depletes the blood and disturbs digestion.

Smokers should keep their mouths and lips very clean, as well as the pipes and holders of which they make use ; for it is a well-known fact that smokers are very apt to suffer from cancer of the lips, throat, and nose. The habit of smoking cigars without a holder is often instrumental in the direct conveyance of contagion, by the reason of the habit cigar-makers have of moistening the cigar-cover with their lips to promote adhesion.

People who do not smoke have as a rule a better appetite than those who do, and possibly the loss of appetite so often complained of nowadays is due in part to the increase of this habit. If smoking is indulged in immoderately, it produces considerable nervous irritation, a feeling of oppression in the chest, palpitation of the heart, and trembling of the hands, and there may even appear graver symptoms that threaten the life of the individual. We know of several eminent surgeons who have been obliged to abandon smoking because their hands trembled during operations, the cessation being followed in a few weeks, in most instances, by a return of manual dexterity and steadiness.

Excessive use of tobacco often proves injurious to the sight, which improves only when the habit is abandoned. Cigarettes are especially harmful, since the paper used in wrapping them is often impreg-

nated with arsenic and other poisonous substances. To counteract the toxic effect of tobacco, vegetable acids and strong black coffee may be administered.

Mankind would be better off, no doubt, if the use of tobacco were wholly discarded. It might not prove a bad idea to prescribe smoking in the schools as a degrading punishment: this would at least have a good effect upon the boys in so far as it would tend to dissipate the foolish notion that smoking makes the man. As has been tersely said by a well-known author, "Boys when smoking imagine they look like men, while men when smoking really look like boys."

**Coffee**, if strong, or if taken in considerable quantities, is by no means so innocent and innocuous as many would fain believe. It disturbs the digestion of some individuals, even when taken in moderate quantities; and upon nervous people, or those suffering from gout, piles, and congestions of the liver or other abdominal organs it acts as a slow poison. The use of coffee should be controlled by the physician, and children should not be allowed to drink it at all. The drinking of strong coffee is never advisable, and is especially unwise after meals, when it cannot help interfering with digestion.

The same may be said of **Tea**. If partaken of too

frequently, it is not at all harmless, but may cause alarming nervous symptoms.

**Cocoa** is much more healthful as a drink than either coffee or tea, and when prepared with diluted milk it is very easily digested and is of considerable nutritive value. In Spanish-speaking countries cocoa is the national beverage.

## HYGIENE OF DIFFERENT ORGANS.

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### HYGIENE OF THE DIGESTIVE ORGANS.

The cavity of **the Mouth** should be cleaned frequently and thoroughly, in order that taste and digestion may not be interfered with by accretions upon its membrane. It should be protected besides from injury by bones, by too hot food, and by other harmful agencies, for these might cause inflammation and ulceration of the mucous membrane, and chewing as well as swallowing would then be interfered with.

**The Teeth** are frequently attacked by disease. Hollow teeth and the bad odor caused by them could easily be avoided by proper cleansing of the mouth. The teeth should be protected from vegetable parasites as well as from the accumulation of tartar ; these should be removed as quickly as possible, or their bad effects counteracted. After each meal the teeth should be brushed with alcohol or cologne, to prevent the particles of food remaining in the mouth from decomposing, for these decomposing remains

of food form a hot-bed for the growth of parasites, which, however, the alcohol will destroy. After this some innocuous powder, such as chalk, egg-shells, bicarbonate of soda, or other alkali, may be used with the brush, in order to prevent the formation in the mouth of acids which will attack the teeth.

The use of charcoal in cleaning the teeth is less agreeable, and should be advised with hesitation ; while ashes must be used under no consideration, in spite of their property of rendering the teeth white, for they destroy the enamel, and so facilitate decay. Healthy teeth, like healthy fat in man, are not perfectly white, but have a yellowish tint. Those who find it impossible to clean their teeth during the day, should at least not neglect to clean them after the last meal, for the long interval from then until morning gives abundant opportunity for the deposit and putrefaction of foreign substances.

The diligent and systematic brushing of the teeth with a brush which is not too stiff is conducive to the health and beautiful color of the gums. Gums which have not been brushed for a long time lapse into a condition of morbid swelling, irritability and sensitiveness : when the use of the brush is resumed, therefore, they will become covered with blood, a condition, however, which will disappear after the brushing has been repeated a few times. The un-

brushed and neglected gums resemble the so-called "proud flesh," which bleeds with equal readiness, and which also needs to be hardened and cauterized.

An additional cause of dental caries is found in inflammation of the gums, whether due to pressure or to exposure to cold; and still another in the excessive use of candies and other sweets, which generate lactic acid—and every acid is injurious unless the mouth be sufficiently cleansed.

**The Throat** and mouth ought to be kept clean for another important reason. It is this, that various and numerous germs of disease constantly enter here, and either remain or pass beyond. These should be gotten rid of by gargling the throat, especially in the morning, with some disinfectant solution prescribed by the family physician. This is to be done in the usual manner by throwing the head backward and driving air through the water audibly.

Besides these germs of disease, there may also adhere to the throat shells, hulls, fish-scales, crumbs of dry pastry, powdered pepper (which causes far more irritation than whole pepper), and other particles capable of giving much annoyance. The irritation produced in the throat and air passages by mustard, mixed pickles, vinegar, spirits, and by strongly seasoned food, may be ameliorated by adding to them milk, eggs, and honey, as is customary in Austria and Poland. Sweet foods and certain

sour ones, which are liable to injure the teeth, may be neutralized in a similar manner, the remaining particles being carried away by succeeding mild food and drinks. The proper preparation and succession of food and drink is of great importance, as all substances which irritate the throat also injure it and bring it into a favorable condition for the invasion and adhesion of the germs of disease.

A farther source of injury to the mouth lies in the excessive use of tobacco, especially when accompanied by frequent expectoration. The fact should not be overlooked that the saliva is a very important digestive fluid, that it is formed from the blood, and that a waste of saliva amounts to a positive loss of blood.

A good way to remove the various particles of food remaining in the mouth and throat is to take a few crackers, or, still better, some stale bread, after every meal, and chew them very thoroughly. This will carry away all remaining particles, especially from the throat, where they may otherwise irritate the larynx. The use of bread at least three or four days old is the best means of cleansing and disinfecting these parts, and stale bread has even been found by Professor Esmarch to be the best disinfectant for cleaning the walls of his hospital rooms. After swallowing the bread, the rinsing of the mouth and throat should be proceeded with.

It is a curious fact that many people, who are scrupulously clean as far as their skin is concerned, are quite indifferent in regard to the cleanliness of their mouths, although the cleansing of the mucous membrane of the mouth is, in a certain sense, the more important of the two.

Every mother should see that her children keep their mouths clean, and should teach them to rinse and gargle both morning and evening, as well as after each meal. In treating affections of the throat, gargling with certain solutions plays an important part, and children should be taught how to gargle while in health, and at as early an age as possible, because it is very difficult to teach them after they have fallen sick. Mothers should also know how to inspect the mouth and throat, and, if need be, they should be taught by the family physician to do so. It is always better, especially if diphtheria is about, to call a physician in time, and this is made possible when the throat is inspected every morning.

One more warning we must not omit. Never allow your child to be kissed on the mouth, if indeed at all. Teach him to turn and hold up his cheek in response to a visitor's advance.

In order to keep **the Stomach** in a healthy condition, avoid filling it unreasonably and frequently with great quantities of food or drink. Heavy, indigestible food should be shunned, while, on the

other hand, it will not do to be too timid in regard to the heartiness of a meal. Treat your stomach as you would any other organ : it should be made hardy and strong, without being overworked ; but it should by no means be allowed to become weak and peevish from having its tasks made too easy. Too much work weakens not only the external muscles, but the muscles of the heart and stomach as well. A reasonable amount of work, however, insures good digestion and a hardy stomach.

The size of the stomach varies in different individuals, and the amount of food habitually taken varies considerably in different races. The colder the climate in which a people lives, the larger will be the quantity of food required. Friedrich von Hellwald reports that among the Samoyedes, the Laplanders, and the Esquimaux it is not a rare occurrence to see a man eat sixteen pounds of meat and as many pounds of fat and blubber at a single meal. Captain Cochrane states that he has seen three Yakutis devour a reindeer at a meal ; and a calf weighing about two hundred pounds is not too much for a meal of five of these gluttons.

The liquid and liquified matter in the intestines enters the blood by way of the capillaries tributary to the **Portal Vein**. This vessel carries it to the liver, after modification in whose structure it passes through the lower vena cava into the right side of

the heart. In order to promote quick incorporation of digestive material in the systemic circulation the flow of blood in the portal vein should be as rapid as possible, an end to be attained by preserving a healthy liver, by full inspirations and by certain movements of the abdominal muscles, while it may be farther promoted by careful regulation of the bowels and by drinking water freely during digestion in order to dilute the thick blood of the portal vein. Decomposition of the contents of the intestines is prevented by the presence of the bile, which at the same time dilutes the digested masses and neutralizes the excess of acids formed in them.

## HYGIENE OF THE RESPIRATORY AND CIRCULATORY ORGANS.

Respiration is indispensable to the human organism, since it provides the oxygen without which we could not live. Health is in danger as soon as we begin to breathe an impure air, or as soon as the function of the respiratory organs is in any way disturbed. We should, therefore, take care to breathe fresh and pure air only, and to protect our lungs and

chests from becoming disordered in any way. The first requirement towards accomplishing this end is a sufficient supply of oxygen.

The atmosphere of a hall where many people have been congregated for a length of time is rendered impure by their exhalations, so that breathing becomes difficult and oppressive and health may be actually impaired. The injurious effect is due not merely to the carbonic acid gas which every person exhales and which accumulates in such rooms, but also, according to recent investigations, to a certain gas, probably nitrogenous, which has not yet been definitely ascertained. The deleterious condition of the atmosphere in such rooms is farther aggravated by gas-lights, by perspiration and other exhalations from the skin, and by various forms of excrementitious matter. If the heating apparatus is not in proper working order, certain gases of combustion are liable to escape unperceived and still farther to vitiate the atmosphere.

An adult requires a little more than one gallon of pure air every minute: a single gas-jet consumes as much oxygen as twelve persons would require, a common iron stove double this amount. Ventilation is the best and in fact the only means of obtaining pure air. Opening doors and windows, therefore, can alone change the vitiated air of the interior for pure fresh air from the outer atmosphere. All rooms

where a large number of people assemble should have arrangements for easy and thorough ventilation. Schools, manufactories, shops, large meeting-rooms, and halls should never be over-crowded, and their atmosphere should be completely renewed every day. Simple fumigation is of no value for this purpose: ventilation can be effected only by a complete change of air.

The room which demands most careful attention in this respect is the sleeping apartment. Bedrooms should be light, sunny, and spacious, and there should be constant change of air, a window, either in the bedroom itself or in an adjoining room, being partly opened at night. Babies' clothing should not be hung up to dry in a bedroom, nor should soiled clothes be kept there. Plants and flowers in large numbers should not stand in the bedroom, as they exhale carbonic acid gas during the night: in drawing-rooms, parlors, and sitting-rooms, on the contrary, plants with large leaves are beneficial, because in the light of the sun they exhale oxygen and absorb carbonic acid gas.

The most dangerous gases mixed with atmospheric air are **Carbonic Acid** and **Carbonic Oxide**. One-half of one per cent. of the latter, if contained in the inspired air, will prove fatal, after a limited time, to men and animals. It is the fatal constituent of illuminating gas. Other dangerous gases are

**Marsh Gas and Sewer Gas**, the latter especially proving fatal at times to those whose work lies in or about sewers. These gases, by entering an apartment slowly and imperceptibly, as they usually do, endanger health and life. Probably their effect is due in part to their affinity for oxygen, which causes a reduction of the oxygen of the blood corpuscles, weakening the whole system and predisposing it to infection.

Air containing much **Dust** is unhealthy. Especially does it affect young and growing persons and those who have weak lungs. For those who are forced from some cause to remain for any length of time in a room filled with dust particles the best protection is a respirator.

**Smoke** in the air, tobacco-smoke in particular, is deleterious to the respiratory organs. Persons who are apt to become hoarse, or who are disposed to cough, should take pains to avoid rooms filled with smoke. Life in the open air, particularly in the woods, is an effective means to the preservation of health and a powerful restorative in chronic diseases. The favorable influence of traveling and of life at sanitariums and health resorts in many instances seems chiefly due to the amount of time spent in the open air.

Living in narrow and dark rooms, where the breathing space is small and fresh air is deficient,

proves very injurious to health, especially when many persons are crowded into one room. By such a manner of living the constitution is sure to be undermined sooner or later, and the individual to become a prey to incurable disease. The remedy in such cases consists, not in medicine, but in fresh air, exercise, and nutritious food. Children suffer most from want of fresh air, whether in school or at home.

Those who follow sedentary occupations should seek the open air as often as possible, but should be careful about exposure to heat, cold, wet, and dust. The effect of breathing fresh air is intensified by methodical exercise. Simple lung gymnastics consist in a number of full respirations. To ventilate the lungs, so to speak, in this manner, the best time is from two to three hours after a full meal, because then the exhalation of carbonic acid gas is at its height.

Since sound lungs are only to be expected in a normally developed chest, the latter should be protected from the various influences which tend to decrease its capacity. Sometimes a deformity is inaugurated during the first hours of life by the bad habit some nurses have of bandaging an infant with unreasonable tightness, a custom as earnestly to be deprecated as that of tight lacing in later years. All

other constrictions by strings or belts are quite as much to be avoided.

One word here about the **Corset**. We do not wish to be considered its irreconcilable enemy : it is its abuse only which must be condemned. A corset with very soft, elastic stays is not only comfortable to the wearer by supporting the bust and giving strength and stamina to the whole body, but it has also the effect of improving the figure and rendering it agreeable to the beholder. A tightly laced waist, however, is exceedingly unhealthy and far from beautiful.

The practice of **Gymnastics**, or **Calisthenics**, as they are more commonly called among us, not only tends to expand the chest and lungs, but serves also to strengthen the heart, causing its muscular elements to become strongly developed and its contractions more forcible and regular. It must always be understood, however, that exercise, as well as work, should not be indulged in to excess. Only moderate, well-regulated exercise in pure air, or bodily work executed under similar conditions, is capable of strengthening the heart and lungs, and, by improving the circulation, the tissues of the whole body. An important consideration in this respect is the maintenance of a proper balance between exertion and rest. If muscular effort is continued too long,

the effect on the muscles is the same as that of prolonged rest ; they are weakened and finally become unfit for any exertion.

The renewal of tissue cells takes place for the most part during rest, while the excretion of waste matters is promoted considerably by the activity of the various organs. For this reason rest is indispensable after exertion, but the want of an equable balance between the two conditions is sure to result in impaired muscular efficiency. The fatigue caused by work is due to an ultimate accumulation of waste material in the tissues, and to the disappearance, more especially from the muscles, of the oxygen necessary to support the tissue changes incident to exertion. We therefore require sleep, not only to get rid of waste products, but, what is more important, to accumulate oxygen in the tissues in anticipation of another day's waste.

**Blood** is the direct source of tissue life. The material which composes the human frame is held in solution in this peculiar red fluid, and is constantly furnished to each tissue as it is required to sustain life. It will be useful, therefore, for us to consider at some length the means of improving and Purifying the Blood.

The products of tissue waste are constantly liquefied and carried away by the smallest blood-vessels, called capillaries because they are as fine as and even

finer than hairs. If these waste matters should remain in the general circulation into which they enter through the capillaries, their accumulation would prove a serious, perhaps a fatal danger. But they are constantly eliminated from the blood by certain organs, while passing through which the blood enters another set of capillary vessels having the peculiar function of separating this waste material from other substances. These blood-purifying organs are the lungs, the kidneys, the liver, and the skin. Only healthy blood, which circulates freely through the capillaries, will be thus purified.

**The Lungs** remove carbonic acid and watery vapor from the blood and transfer them to the air which is about to be exhaled ; while, by the reverse process, oxygen is inhaled and absorbed by the blood. Here, again, pure air is a necessary condition for the proper excretion of these bodies.

**The Liver** removes a large amount of waste matter from the blood, principally from that of the portal vein. From a part of this, mostly from broken-down blood corpuscles, **the Bile** is formed. Bile plays an important part in the digestion of fatty matter, after which a portion of it passes out of the system by way of the bowels, another portion however being reabsorbed and returning to the liver. The proper activity of the liver is sometimes interfered with by pressure. This may be due to tight

lacing, or to belts, or to sitting continuously in a cramped position. Pressure on the liver and abdomen impairs the circulation in the portal vein, and gives rise to digestive troubles, piles, and other ailments.

The Kidneys are of great importance in the purification of the blood, since the waste products of albuminous compounds in the tissues are excreted by them in the form of urea dissolved in water. If tissue-changes have not taken place normally, or if, for some reason, the oxygenation of these products has not been thoroughly performed, they appear as uric acid, or, in combination with alkalies, as urates. The liquid formed by these processes is the Urine. The excretion of such waste materials may be materially assisted by the free use of pure water in drinking, or by that of carbonated and mineral waters, thus assisting the purification of the blood ; or by that of alkalinic waters and other means for neutralizing the excess of uric acid in the blood and urine. The same plan may be followed when some affection of the urinary organs exists, the object being to dilute the urine and thereby render it less irritating to the affected parts.

But such rules do not hold good in every case. Very fleshy persons should not imbibe much water or other liquids, as these accelerate digestion, while such persons should eat little and digest slowly.

Furthermore, the heart is overworked by the increased blood pressure which results from the ingestion of large quantities of fluid, and at the same time the lungs are interfered with in their respiratory work.

## HYGIENE OF THE SKIN.

The skin does its share in the work of purifying the blood by means of its gaseous exhalations and of the perspiration. Its other functions are numerous. It protects the sensitive nerve ends through whose agency we experience the sensation of touch, and it is the great regulator of animal heat. Still another use is that of respiration: Aubert has shown by experiment that the skin gives off carbonic acid and absorbs oxygen. For these reasons it is important that it should be well cared for. The temperature of the body is regulated by the evaporation upon its surface: the heat necessary for the evaporation of the water in the capillaries of the skin is drawn from the general heat-supply of the body. The greater the amount of evaporation, therefore, the greater is the reduction of temperature, and *vice versa*. This

regulation of bodily heat is assisted to a certain extent by the hair upon the skin and by the dress.

The principal requirement for a normal action of the skin is cleanliness. To this end frequent Bathing and change of clothing are indispensable. In cold weather, however, it is not advisable to wash the exposed portions of the skin, the face and hands, too often, nor even to wash them in cold water at all. Lukewarm water should always be made use of, together with a mild soap, the alternative being the chapping of the hands and face, and even the appearance of salt rheum or eczema upon the skin. When frequent washings cannot be avoided in the winter time, the exposed portions should be rubbed with freshly prepared cold cream, vaseline, or glycerine.

A vapor or hot air bath may be indulged in now and then as a means of thorough cleansing ; but it should never be undertaken by persons affected with lung or heart diseases, and therefore never without the advice of a physician.

**The Hair** of the scalp and beard must be properly cared for. The use of some fatty substance, preferably an animal, not a vegetable fat, is beneficial.

The stronger the individual constitution, the thicker, as a general rule, will be the hair, while in sickly persons and those whose blood is thin the

hair is badly nourished and in poor condition. The fatty matter, which naturally exudes from the skin and permeates the hair, causes it to remain moist, soft, and pliable, while without it all the water contained in the hair would evaporate and leave the hairs dry and friable. The careful removal of dandruff, which owes its origin mostly to dust and to the use of certain kinds of pomade, is absolutely necessary to the growth of the hair and to its proper lubrication by the fatty matters of the skin. The condition of the scalp, therefore, is of very material importance to the growth of the hair. Washing the scalp with spirits is unwise, since it causes great irritation: a much better plan is to use the yolk of an egg or diluted honey. Girls and women should never tie their hair too tightly, nor should men and boys wet theirs nor have it cut too often.

Of all the vicissitudes our skin is called upon to endure the most frequent and the most carefully to be guarded against is **Exposure to Cold**. An intense cold, a wind, or a draft of air striking the skin while hot and perspiring, causes not infrequently a sudden contraction or dilation of the blood-vessels in some particular organ, resulting in what we call "taking cold." A cold may be contracted, however, from agencies of much slower operation, as, for instance, from wearing too thin clothing, from throwing off the covers while sleeping during the night,

from sleeping next to a cold wall without protection from it, from living for a long time in cold and damp apartments, from standing in water while at work, or from a damp, cold atmosphere.

**Sheep's Wool**, if worn next the skin, protects directly from colds, as it imbibes the perspiration quickly by reason of its hygroscopic properties : thus the skin remains dry and the seat of evaporation is changed. It is especially advisable for those who perspire freely to wear woolen underclothing during hot weather. The best preventive against taking cold is the plan of keeping the feet, the back, and the abdomen constantly warm, without, however, raising too much the temperature of other regions.

Climate should influence the manner of living and of dress. Our feelings as to temperature in different climates depend largely upon habit. When the inhabitants of temperate climates are freezing, Esquimaux feel comfortable ; and when the former experience comfort, those from a tropical country are apt to feel cold.

The difference between black **Clothing** and white is well known. Black absorbs heat rapidly, while white does so to only a very slight degree. The former color is therefore best adapted to cold seasons and climates, the latter to a heated atmosphere. Black goods also possess the property of absorbing

with facility the vapors which contain infectious germs, and for this reason dark woolen dresses are inadmissible for nurses.

Every article of wearing apparel should be made sufficiently large to admit of the free passage of air between the clothing and the skin. Evaporation and consequent coolness of the skin are thereby promoted. Clothing of ample proportions is therefore to be recommended during the hot season, as well as to those who live in hot countries. But loosely-cut clothing is also very agreeable in cold weather on account of the disadvantages of tightly-fitting articles, such, for instance, as gloves and shoes. Most of these disadvantages have already been referred to: it is enough now to say that they prevent the circulation of air next the skin, and so do not keep the wearer as warm as looser clothing. A very objectionable and even dangerous habit is that of wearing garments which compress the neck, the chest, or the region of the stomach.

The Head, being partially protected by hair, should be covered only lightly, and should be kept cool. Only heat, cold, and wet are to be guarded against. The hat should be very light, and should not fit the head too closely. It should not be kept longer than strictly necessary upon the head, and should be provided with due means of ventilation. Failure to observe the above rules will often lead to

baldness. Hats of braided horsehair are the best for summer use, but preferably a parasol should be used as a protection against the rays of the sun, and the hat should be carried in the hand.

**The Neck** should be left uncovered from childhood up. Stiff, high **Cravats** and **Collars** ought not to be worn, but only such as are large enough to admit the introduction of at least three fingers. Paper collars are often impregnated with zinc or lead, and may become dangerous to persons who perspire a great deal.

**The Chest** should be clothed in garments sufficiently loose to allow of full expansion. Tightly fitting dresses and corsets in the case of women, and vests or coats tightly buttoned up to the neck, are unhealthy in masculine attire. **Suspenders** are to be considered an abomination, especially when made of inelastic material. In France, Austria, and some other countries suspenders are entirely dispensed with by a large number of people, because the trousers are made to fit closely over the hips and the buckle at the back is sufficient to control them so that they sit comfortably without suspenders.

**The Corset** is used in a most unreasonable manner so frequently that the wish to see it discarded absolutely is a very prevalent one. This, however, is not to be expected, and, if due attention be paid to the rational construction and sensible wearing of the

garment, is unnecessary. At all events young girls should not be allowed to wear corsets before the age of puberty. For women it should be so arranged that the region just below the ribs may not be compressed; for, around the pit of the stomach are grouped in the interior of the body the most important vital organs, the heart and lungs above the diaphragm, and the liver, stomach, and spleen below it. The normal action of these organs suffers, of course, by compression.

The dire effects of tight lacing are very evident in some cases: the liver, and sometimes the spleen, show grooves caused by the pressure of the ribs and of the sharp extremity of the breast bone. How could such organs continue to act normally? It is impossible, and the purification of the blood as well as the formation of the bile are impeded by the crippled condition of the organs upon which they depend.

The surgeon knows very well the weakening effect of corsets upon the muscles they compress. A leg just released from a plaster-of-paris casing, which has held it far more loosely than a corset, is nevertheless emaciated, and remains weak for a certain time. Still more does the corset, instead of improving the figure, utterly disfigure it by rendering the muscles of the back and chest more or less incapable of use. No one would think of putting a

paralyzed arm into a splint; on the contrary one would exercise it, employ it, apply massage to it: but a weak back we swathe in bandages, instead of bathing, rubbing, and exercising it: in other words, we complete the paralyzing process.

A second effect of wearing corsets is the restraint they impose upon the movements of respiration. If we measure with a spirometer the quantity of air which can be inhaled and that which can be exhaled, we find that from twenty to thirty-four per cent. less air is inhaled beneath a tightly-fitting corset than when the corset is loosely worn. Such a sequence must inevitably deplete the circulation and predispose to consumption.

Another effect of corsets is the mechanical pressure exerted upon the contents of the thoracic and abdominal cavities, which, according to numerous estimates, should weigh in the adult between twelve and eighteen pounds. This weight, which rests directly upon the waistband, bears much more heavily upon it by reason of the constancy of the pressure, while it causes the whole structure of the rib-wall to be displaced and the liver to be so impinged upon that its right extremity adheres to the chest-wall by little more than a single thin band of ligament. The upward effect of this pressure is to cause stagnation of blood in the heart and lungs, and often in the brain as well: the downward pressure affects organs less

closely adherent, and is, therefore, liable not only to cause similar interference with the blood current, but also numerous displacements and deformities. In fine the maledictions of specialists in lung, heart, stomach, and mental diseases alike, and above all of gynecologists, are wont to be heaped upon this senseless article of fashion, which, like many another instrument of torture, is said to owe its development to Spanish sources.

“The more nearly a woman’s waist is shaped like an hour-glass, the more certainly does it show us that her sands of life are running out.”

While blood accumulates abnormally within the corset, and congestions and inflammations of the lungs and abdominal organs are frequently induced by it, deficiency of blood and resulting coldness prevail at lower levels. For the same reason women err also in wearing the **Garter** below the knee. This practice undoubtedly causes coldness of the feet and throws back upon the body a portion of the blood which should make an unhindered circuit of the limbs. Garters should never be worn, but when persisted in, should be placed above the knees, not below them.

The Feet are frequently tortured by tight shoes, whose pressure impairs their healthfulness of function. Cotton stockings are preferable except for those who suffer from excessive sweating of the

feet: these should wear woolen stockings constantly. Rubbers and arctics are very useful in cold and wet weather, but should always be removed while in a warm room. Rubbers are not to be recommended for constant wear, because they interfere with proper ventilation of the feet. Two pairs of shoes are desirable for each individual, to be worn on alternate days, since a single night's exposure to the air is usually insufficient to free these articles from moisture.

All articles of clothing should be changed as frequently as possible. Especially should wet garments be replaced by dry ones as soon as opportunity offers. Cases of arsenical poisoning have occasionally been observed as a result of wearing goods in whose coloring matter arsenic is found. Green colors are most suspicious in this connection.

Many refined women complain that equality of rights is denied them and that they are thereby kept in subjection to the male sex. The greater subjection however would seem to be that which they endure of their own accord. A woman who wishes to appear ladylike must pay dearly in a certain species of slave-chains: for the iron-clad, steel-plated corsets which prohibit free mobility and suppress all feeling of personal liberty, the painting of the face, the sleeves which fit tightly like bands about the arms and restrain motion at shoulder and elbow, the high

heeled shoes, more than all that enemy of comfort in sitting, the bustle—by what other name shall we call these? And to what purpose such endurance? Only to disfigure and degrade the finest piece of nature's handiwork, lovely woman. Sensible men invariably prefer the natural appearance and simplicity of manner to those artificial ones which so often only serve as a cloak to the reality. The women of ancient Greece were far wiser in this regard than those of a later day: they knew full well that health means beauty, and they acted upon this knowledge.

It seems to us full time for the refined American lady to emancipate herself from fashionable humbuggery in dress and to send a real declaration of independence from a senseless tyranny to those aristocratic dames of Continental monarchies who at present dictate fashion. By so doing, no doubt she runs the risk of losing the sympathy of weak-minded dudes, who are either aristocrats themselves, or who assume aristocratic airs; but in this we can see no disadvantage, for she would gain thereby the respect of men who are genuine representatives of republican intellect, sense and character.

We cannot too strongly deprecate the laying of too much stress upon the question of dress and upon external appearance in general. It always shows lack of good taste, and it may in the end undermine the moral nature of the individual. Children should

be brought up with this principle in view. They should never be restrained by dress from that full liberty of movement which ensures perfection of physical development.

But while we thus strongly object to the fashionable attire of women, we must not be understood to maintain that the dress of the stronger sex is any more an ideal one. The style of dress adopted by the ancient Greeks and Romans was far more sensible and practical, especially in summer, as is that of the Mohammedan peoples of the Orient to-day, admitting as it does far greater liberty of movement. Among our own people the costume of the American mountaineer may be commended for comfort and convenience, and its use advocated everywhere in summer, even in the larger cities.

The climate of America is a milder one than we or our ancestors have been accustomed to in Europe. Loose-fitting clothing, therefore, is more appropriate here than there, and only when the winter season brings a return of arctic rigors should resort be had again to the bondage of high collars, gloves, and silk hats. In any case we can well afford to do away with the short overcoat, which not only gives a ridiculous appearance to the figure, but is totally inadequate to give needed protection to the abdomen.

## LIGHT.

**Light** is an essential of life, not only by its direct action upon the skin and by serving as the medium of vision, but also indirectly, because through, by, and in it alone can the development of oxygen in the vegetable organism take place. This process results in the exhalation of oxygen by the leaves and other organs of the plant, while they inhale and decompose carbonic acid in order to utilize the carbon for the nourishment of the organism. Moleschott calls both flowers and fruits "children of the light, woven from sunny air." They are condensed sunbeams, so to speak. With vegetable matter, in the form of coal and wood, we heat our rooms ; and by using vegetable substances as food we are enabled to perform muscular work and exercise. Thus, light is the indispensable medium of life, while plants, animals, and human beings, deprived of light, it has often been illustrated, become pale and emaciated and soon perish.

"Sunlight aids in maintaining the purity of the atmosphere by the part it takes in transforming the

chlorophyll of the green portions of plants. By its influence the air is freed from carbonic acid, whose poison would otherwise collect in increasing quantities, and which it replaces with invigorating oxygen. So efficient a purifier of the atmosphere is sunlight that it assists the oxidation of the organic materials it contains and so their removal. For instance, the musty smell which strikes one so disagreeably in living rooms is stronger and more tenacious in north-easterly rooms than in those which face southward and which are consequently exposed to the sun. Finally, sunlight destroys certain microorganisms in their very germs. The influence exerted by lack of sunlight upon the development of disease has been estimated from statistics collected among the children reared in Rostock at the public expense. Of ninety-eight such children twelve were affected with scrofula, that precursor of consumption, of whom four lived in cellars and five in dark attics, where the sun could not penetrate. And in Italy, the classical abode of that disease, the origin of malaria may frequently be traced to the same cause."

The air of a well-lighted room is better than that of a dark one. Thus the Italian saying, "Where the sun does not enter the doctor does," may be regarded as tolerably correct. Sunlight gives courage and hope and makes us glad, free, and happy. If the sky is overcast, if fog and darkness reign supreme,

then beware of melancholia, of hypochondriasis, of despondency bordering upon suicidal mania.

Too much sunlight, however, like every other excess, works harm. The weary traveler, wending his way through the southern Sahara, treads upon sand in which an egg is hardened within a few minutes. No wonder his feet are soon covered with blisters; no wonder the exposed portions of his skin are soon scorched and blistered too by the merciless rays of the fiery orb.

The danger from exposure to heat in our climate is of a somewhat different kind. In our large cities we are affected, not only by the direct rays of the sun, but also by the heat that is reflected from the sun-scorched walls of buildings and from the stones of pavements and sidewalks. In open country the conditions are decidedly better. The air is purer, and the lawns and meadows and woods absorb much of the heat, so that radiation is much diminished. It is in accordance with this suggestion from nature that we try to protect ourselves against too strong light by using shades for our eyes to reflect the rays of heat and light. For a similar reason also it is that we wear light clothes in summer.

## HYGIENE OF THE NERVOUS SYSTEM.

The nervous system requires food that is rich in albuminous and fatty matter. Phosphorus is absolutely indispensable, since nervous tissues contain a large amount of it, partly in albuminous compounds, and partly in alkaline phosphates. Milk, eggs and meat are therefore the best foods for nourishing and strengthening the nervous system, together with sufficient quantities of fat and carbo-hydrates.

The circulation of blood through the organs of nervous action must be properly regulated. This may be achieved by suitable exercise and deep inspirations. Light, warmth, and pure air, the air of the forest in particular, tend to improve the health of these organs.

Any organ in the human body, if put to but little use, gradually diminishes, it is found, in force and energy, continued inactivity leading to a complete withering of its substance. In like manner a **Brain** kept in a state of inactivity loses by degrees its power of perception and judgment. This is best illustrated in certain instances where children have grown up among animals, without any intercourse with human beings. Such children have been found incapable of speech, unable to tell right from wrong, and exhibiting no trace of reason : their feats of bodily skill and

activity however are superior to those of which most animals are capable.

Our brains are best nourished and strengthened by work, just as our muscles become harder and firmer by constant use. The brains of men who have done considerable mental work during life show some peculiarities which illustrate this principle ; the substance of the brain is of unusually hard consistency, and the grey matter of the cortex and gyri is remarkably developed. It seems more than probable that the continually increasing size of the human skull, especially of its anterior portion, is due solely to the progress of civilization. The human race, at least, is constantly perfecting its intellectual resources and capabilities. This because of the combined influences of heredity and education which are constantly at work, moulding and shaping men and their intellects, their brains and their skulls.

The selection of brain work requires a great deal of care. Beginning with easy and gradually progressing to harder tasks will never occasion dangerous after effects, such as we frequently observe in children. Their brains are normally much softer and contain a larger amount of liquid contents than those of adults, and they should therefore be very carefully dealt with. Still worse is the experiment so often tried in our schools of forcing sickly, anaemic children to the same rate of progress with those who are

healthy. For the former, inasmuch as their brain-substance is poorly nourished, are far too slow to satisfy their instructors, and in some instances are entirely unfit for mental effort. This sort of forcible intellectual training, of which many parents and many teachers are guilty, is the more harmful to a growing brain, the less satisfactory are the external conditions surrounding the child, such as improper feeding, poor living, and insufficient rest. Nothing is so hurtful to a brain as disproportion between work and rest. Mental vigor is always impaired by over-exertion at hard and long-continued labor, by irritation from frequent and unnaturally violent nervous impressions, by want of sleep, or by severe intellectual effort.

Among the causes of unnatural excitement alcoholic liquors play an important part. At first they seem to enliven and stimulate the brain to greater activity, but soon the weakening and depressing effects manifest themselves.

Sleep is absolutely indispensable to maintaining the normal composition of the brain substance and thereby to the proper supply of brain force. The more work the brain has accomplished, the more sleep is necessary for recuperation. Sleep will refresh and invigorate the brain, as well as the nervous and muscular systems, only when it lasts sufficiently long, and when it is uninterrupted, sound,

and quiet. To fulfil these conditions must therefore be our aim. Attention must consequently be paid, not only to the frequency, the regularity, and the length of the period in sleep, but also to the surroundings during sleep.

**The Bedroom** should be spacious, moderately warm, and quiet, and its air should be kept dry and pure. It should face toward the south, and should be as far removed as possible from all damp, mouldy, and ill-smelling localities. If one person sleeps alone in a large room whose window he does not wish to keep open over night, he should at all events thoroughly ventilate the apartment for some length of time before retiring. But when several persons sleep in the same room the air can only be kept pure by constant **Ventilation**. Leaving the windows open all day long, but closing them at night, does not afford sufficient change of air. In a badly ventilated bedroom one is extremely liable to inhale the floating germs of disease and other noxious particles during sleep. For this reason perhaps, infectious diseases occur much more frequently in winter, when ventilation is not so thorough as in warmer seasons, most persons being unreasonably afraid on account of the cold. Good ventilation however tends rather to establish currents of air, which remove these germs completely, or at least in large part; and even, should some enter the body, the latter will be in better condi-

tion to resist their action on account of its increased supply of oxygen. Perhaps also the germs are rendered harmless in a mechanical way by good ventilation; while in impure and damp air, where respiration is not so well sustained, germs which have already been inhaled are less likely to continue floating in the inspired air and to be exhaled with it before effecting a lodgment. Healthy individuals can surely sleep with open windows, when in some English and German hospitals the sick are compelled to do so to their great benefit, the only precaution taken being to avoid a draft directly upon the person. In various German institutions for the treatment of consumptives it is an inflexible rule that patients are not allowed indoors: not only do they lie upon cots in the open air all day, but at night they are removed into open tents; this treatment being attended by the most gratifying results.

In regions, however, where intermittent or yellow fever prevails, and where various forms of malaria are indigenous, ventilation must be very carefully regulated, the windows being opened only during the day, for at night the poisonous exhalations from the ground are most active, especially if rain has fallen shortly before. And indeed, under all circumstances it is safer, when windows are left open, to sleep in a room as far as possible from the ground. These rules become less imperative after a long

drouth and during continuous rain or cold northerly winds.

In winter time in our climate the stove is a bad neighbor so far as the supply of fresh air is concerned, for it needs a great deal of oxygen, twenty-four times as much as a man, and this it robs from its human room-mates, only to return them an occasional whiff of smoke mingled with treacherous gases. But ventilation will overcome all this, if sleeping in a cold room is not considered desirable. When the windows are open, enough oxygen will be supplied to the sleepers as well as to the stove.

All lights should be extinguished before retiring, as their presence is irritating, not only to the eye, but also to the brain. The worst of all lights to sleep by is a gas light, unless turned quite low, for a strong gas jet consumes twelve times as much oxygen as a man, and for this reason it should at all times be avoided where ventilation is not good.

A few other points may be referred to in connection with sleep. The covers should be drawn up over the stomach in order to keep it warm. For full-blooded persons the pillow should be moderately high, so that the head is raised above the level of the body. In the case of the anæmic, however, it is generally better to sleep with the head lower, and even on a level with the body. Lying upon the back is to be avoided, since it may cause irritation of the

spine and consequent nervous excitements. When constipation exists, physic should be taken at such a time that its effect will not disturb the night's rest. Other natural desires should be heeded at once, because quiet sleep is impossible unless this be done.

Another rule indispensable to good health is, never to sleep upon a feather bed. Owing to the non-conductive properties of feathers, the gases of the body, so detrimental to the human system, accumulate within the soft mass. Moreover these beds are the general reservoirs of the various exhalations from different bodies which have lain upon them. Hence husk, palm-leaf, or hair mattresses should be adopted in their place.

#### HYGIENE OF THE EYE.

The eye of the newborn infant should be exposed only very gradually to the light. Moderate light and darkness alternating suddenly are as hurtful as intense light alone. In childhood the eyes should be protected from sunlight by a hat with a broad brim. Very brilliant or glittering objects should not be looked at for any length of time. During sleep, as well as immediately upon awakening,

the child's eye should not be exposed to strong light. In school, children should be taught very carefully how to use their eyes. They should never be allowed to read, write, or draw in an insufficiently lighted room: there is nothing that will injure the eyes more seriously nor more rapidly than a failure to comply with this rule, and yet none is more frequently sinned against. Often the supply of light in school rooms is very poor, not exceeding the light of dawn. Often also reading, writing, or drawing is practiced after sundown or by a poor artificial light. Blackboards should never have shiny surfaces: a dull one is preferable. The most important recommendation, however, is this: never continue for a long time those occupations which require the constant use of a child's eyes. It is actually a crime to require children to write and read and sew and draw for hours at a time. Gothic type, such as is used in Sweden and Germany, is very trying to the eye, much more so than the Roman type in use with us, and it should therefore be discarded, especially in the schools. The small type employed by many American newspapers is another evil to be condemned. In reading while lying down it is hardly possible to hold the book in a favorable position, so that the external muscles of the eye are almost inevitably subjected to strain. In addition to this, when the head is on a level with the body instead of erect there is a ten-

dency to the flow of an excess of blood toward the eyes. Fine embroidery, lacework, and fine needle-work in general, being notoriously destructive to the eyes, should be forbidden, and especially preparing Christmas presents in this way. When selecting an occupation or business for a young man, the condition of the eyes should be considered much more generally than is at present the custom. In selecting eyeglasses a physician should always be consulted, and the purchase should be made from a reliable optician.

The eye is affected very unfavorably by light strongly reflected from such surfaces as snowfields, sandy plains, limestone cliffs, bodies of water, walls painted with light colors in oil, smooth French flooring, polished furniture, and other shining objects. The best means of protection against this reflection of light lies in the use of blue and other colored glasses, of blue veilings, and of white parasols with blue linings. Frequent closing of the eyes or fixing them upon objects which are in the shade or which have a dull color, are measures farther to be recommended. The fact should always be kept in mind that a strong light is much more easily borne when it comes from above than when it strikes the eyes from below or from the side.

Since natural light is less fatiguing to the eye than artificial light, and since, as a rule, it strikes the

eye from above, every task, including reading, should be performed, so far as possible, by daylight, and artificial light should be made use of principally for pastimes and for easier employments, where little strain is put upon the eyes. And even this only up to a reasonable hour in the evening. The use of artificial light is not only obnoxious to the eye, but, by radiating warmth, and by the bent position of the head, it is hurtful also to the brain and to the whole body, as we see notably in cases of insolation in those who work in factories by gaslight. The direct rays of the sun too are hurtful. The best light is obtained when there are a few thin clouds over the sun to act as a shade and reflector and so to increase the perspective. Dover and Calais can very seldom be seen simultaneously, and then only when thin clouds cover the sun.

Since the visual power of the eyes is limited, as are the functions of all our organs, and to a greater degree before adult life is reached, they should never be used up to the point of fatigue. When, nevertheless, an exacting employment of the visual power is required by force of circumstances, a systematic change of occupation should be practiced, for the eye will bear much more work, if the objects to be looked at are changed at certain intervals. But the best safeguard, of course, is occasional complete rest.

## HYGIENE OF THE EAR.

The external auditory canal requires frequent cleansing, but always with caution. It quite often becomes filled with hardened wax, causing difficulty in hearing or even deafness. Such an accumulation may be removed by softening it with sweet oil and then syringing the ear with warm water. Hard instruments must never be employed in unskilled hands for fear of injuring the delicate internal structures.

The ear should be protected from drafts, especially when the individual feels very warm : otherwise inflammation may set in and destroy the drum membrane. The same is true in regard to cold water. Many cases of inflammation of the middle ear have resulted from the forcible entrance of cold water into the ear. If the inflammation is transmitted to the membranes surrounding the brain, death is likely to result. Caution must always be exercised whenever an abnormal discharge is found to be issuing from the ear, for the simplest inflammation may spread to the air-cells in the bone behind the ear, and so give rise to dangerous symptoms. Not only under such circumstances, but in any case of severe ear-ache, a physician should be promptly consulted, for, failing an exit to the outer ear, a gathering of pus may force

its way into the cranial cavity and form an abscess there. Blows in the region of the ear are very dangerous, their force sometimes being sufficient to cause paralysis of the nerve of hearing, and consequent deafness. This is not infrequently the result of the "boxed ears" or the "tweak of the ear" so often administered by thoughtless parents and teachers.

## HYGIENE OF THE NOSTRILS.

The seat of the special sense of smell is in the upper part of the nasal cavity, where the olfactory nerve expands into numerous filaments in the mucous membrane. This region must therefore be protected from disease.

The nose of a child should be frequently and thoroughly cleansed. Picking and boring with the fingers should be forbidden, as well as the introduction of foreign bodies. Very cold air or air containing irritating substances, such as dust or smoke, should be avoided, as they are apt to produce nasal catarrh, commonly called a cold in the head. When smelling a flower, it may happen that an insect is

drawn up into the nose : this too must be guarded against. Excessive use of strong snuff is injurious to the sense of smell.

## HYGIENE OF THE TASTE.

The tongue is the principal organ of taste. It may lose this property wholly or in part, if its mucous membrane is changed in any way, the papillæ, the little wart-like excrescences which contain the terminal filaments of the gustatory nerve, becoming degenerated, or the nerve endings themselves becoming excessively irritable.

The tongue must, therefore, be protected from the action of burning, irritating, and sharp substances, like tobacco, spices, and pickles, and from food and drink which is either too hot or too cold. The sharp edges of broken teeth may injure the tongue mechanically, and a similar effect may follow coughing in infants who have acquired only the first two teeth, because the tongue is protruded with every fit of coughing and rubbed over the upper edges of these teeth.

## HYGIENE OF THE VOICE.

The air which we inhale passes through the throat and on either side of the vocal cords. It should therefore never be of an irritating nature, because catarrhal inflammation of the throat, with hoarseness and cough, is apt to be caused in this way. Cold air must be avoided, as well as air containing particles of dust, smoke, especially tobacco smoke, and such gases as chlorine, ammonia, and illuminating gas. If catarrh of the throat occurs repeatedly in an individual, and it usually is quite obstinate and sometimes of long duration, the mucous membrane of the vocal cords becomes considerably thickened and the voice acquires a peculiar hoarseness, its softness and metallic ring being lost. Catarrh may be easily produced by exposure to cold air after any considerable exertion of the voice in singing, or after loud and prolonged speaking in a heated room. Under such circumstances it is a good plan to protect the throat by a shawl or scarf, and by keeping the mouth closed, so that the inhaled air is partially warmed and filtered in passing through the nostrils. Food and drink may also act injuriously upon the throat, if taken very hot or very cold,

or if of an irritating nature, such, for instance, as strongly spiced or very sour foods. Alcoholic liquors frequently have the same effect, particularly when taken immediately after meals. After exertion of the throat ice-cold drinks are always hurtful. It is well to be careful about everything that is to be swallowed. Saliva which contains tobacco-juice must be carefully guarded against, as well as small sharp bodies, bones, and the skins of fruit and vegetables. The throat should never be subjected to prolonged exertion in loud singing and speaking, because not infrequently a very decided weakness of the voice may result. This has been known to become incurable, as many singers and vocalists have learned to their cost, not a few splendid voices having been ruined in this manner. The throat also requires protection externally, but should never be wrapped in very tight or very warm apparel. If heated and perspiring, however, it should not be exposed suddenly to cold. The best way of rendering the throat insusceptible to changes of temperature is to become accustomed to cold ablutions and to wear collars and clothing very low in the neck, so that the throat becomes hardened to exposure. The subjecting of other regions of the body, for example, of the feet, to cold and like harmful influences is to be guarded against, for in this way inflammation of the

throat may be occasioned through reflex nervous action. Fresh air and exercise benefit the voice by their effect upon the muscular system in general, a consideration which should lead every vocalist to give special attention to physical training.

### HYGIENE OF THE MUSCLES.

A proper alternation between exercise and rest is a prime necessity for a healthy condition of the muscular system. Muscular fatigue is caused by the accumulation in the muscles of waste products, which are formed more rapidly by exertion than they can be carried away in the blood-stream. But there is still another source of fatigue. The oxygen necessary to the proper performance of muscular work is present in the muscle beforehand, and its store cannot be replenished during exercise. When therefore the amount of oxygen present is exhausted, fatigue begins. A fatigued muscle is physically and chemically different from what it was before its task was commenced. Rest alone can restore it to its former condition.

By the constantly alternating pressure which a

contracting muscle exerts on the blood and lymph vessels in its neighborhood the circulation of these liquids is accelerated, the current in the veins, which return the blood from the general system to the heart, being particularly influenced. It is well known that, when attention is concentrated upon certain nerves and muscles, the muscular exertion relieves the tension of the brain; and thus the fact is explained that hard bodily work and continued muscular exercise free the mind temporarily of many of its cares. The elimination of waste material takes place chiefly during rest, and mostly through the kidneys in the form of urea, as we have already seen. At this time the flow of blood to the muscles increases, new material is furnished them in abundance, and new muscle and nerve substance is formed in store for future demand.

Muscular exercise is of paramount importance, for every movement and almost every activity of the body is due to muscular exertion. The same agency furthermore generates manual dexterity and force, strengthens the will, quiets the brain, helps develop the bones of the frame, and assists greatly those important physiological processes, circulation and purification of the blood, the movements of respiration, and digestion.

By overexertion much harm may be done, weakness induced amounting almost to palsy, enormous

development of the muscular system effected at the expense of other organs, particularly the brain, which then becomes very slow and dull, anaemia developed in consequence of overtaxing of the blood, enlargement of the heart brought about with palpitation, and dilatation of the lungs with asthma. Disfigurements and deformities of various kinds are likely to result, when certain parts only of the muscular system are used. Frequent and rational use of a muscle, followed by sufficient rest, will make it plump, hard, and strong, while continuous inactivity renders it flabby, thin, and at last fatty.

Subjoined are certain **Rules to be Observed during Exercise.** All tight clothing, especially about the neck and chest, must be removed. The various sets of muscles should be trained, and therefore the movements must involve all the joints, alternating systematically. The muscles of respiration and those of the abdomen should be particularly remembered. The various troubles of the digestive organs are thus favorably influenced, and affections of the heart and lungs successfully combated, inasmuch as a narrow chest may be broadened by rendering the contractions of the respiratory muscles more efficient.

Extreme fatigue should never be induced. As soon as there is an appreciable feeling of fatigue, exercise should be suspended. Although the number

of working hours in Europe exceeds that customary in the United States, the amount of work performed here is greater and produces more fatigue. Rest should continue until all feeling of fatigue is gone.

The intensity and duration of the movements practiced must be increased very gradually, if increase of muscular strength is desired. Nutrition must be proportioned to the activity of the body, otherwise the system will succumb. Poor diet will always tell at last, because income and expenditure are not equalized. Pure air and full breathing are required during and after exercise: the latter not only promotes change of air in the lungs, but also quickens the functions of circulation and digestion. As soon as rapid respiration and palpitation set in exercise should cease; also when headache, dizziness, and other disagreeable sensations are present, when the face becomes pale and pinched or flushes suddenly, or when a feeling of great heat or excessive perspiration sets in. People who suffer from heart or lung diseases must be particularly cautious as to exercise. Eating must be avoided shortly before or shortly after any considerable exertion, as digestion is thereby impaired. Exposure to cold on such an occasion is especially injurious to the heart. When not in a position to practice muscular exercise, massage of the muscles should take its place.

If the above rules are followed closely, the salu-

tary effects of exercise will be speedily experienced. Affections of the brain and nervous organism of a functional nature, such as hysteria, hypochondriasis, melancholia, sleeplessness, and despondency, will soon disappear. Disturbances of the circulation will be improved or wholly cured, since the heart and blood-vessels are enabled to contract more forcibly. The blood will become healthier, because the waste material is carried off more efficiently. Persons suffering from gout, rheumatism, or obesity will feel as though created anew, and anæmic and chlorotic girls will regain their color and lose the curvatures and deformities of the spine which are due to muscular weakness.

Healthy exercise is best obtained through such sports as rowing, skating, swimming, fencing, tennis-playing, bicycling, and horse-back riding. **Dancing** in itself is a healthy exercise, but it is almost invariably overdone, and the surrounding conditions are decidedly unfavorable; no rest is taken between the dances; it is indulged in at night after a proper bed-time, in tightly fitting dresses, and in hot, dusty, poorly ventilated halls, crowded with people; then also it lasts too long, and too much drinking is habitually indulged in at balls, parties, and similar assemblages. Dancing on platforms erected in the open air in shady places, preferably in the woods, is far less objectionable. The

action of cold upon the skin and lungs is much to be dreaded, and sudden changes of air when dancing must be carefully guarded against.

Gymnastics and Mountain-climbing are upon the whole the best methods of exercise, provided the rules we have given are acted upon. The air in large cities is far from possessing the purity desirable to practice athletic exercises in, and it is better on this account to establish the gymnasium in the upper part of the house.

Calisthenics are coming more and more into use every day for ladies and girls, although much still remains to be done toward their perfection. This is a branch of education which deserves wider attention—not only that it is much more healthy than many semi-superfluous theoretical studies; but it actually tends to improve the complexion and beautify the face and figure.

Nothing should be regarded as of greater importance than healthy exercise, and there is no exercise preferable to mountain-climbing. Here a variety of favorable conditions obtain, healthy ground, pure air, a healthful mode of exercise promotive of vigorous respiration and digestion, and the profound enjoyment and equanimity which accompany the constantly changing aspects of beautiful and majestic landscapes. In mountain-climbing accordingly, to the directly beneficial effect upon the

health of the individual we find added the peculiar gratification enjoyed by every lover of nature. It is to be regretted that only one Alpine club, of the kind so prevalent in many countries of Europe, at present exists in this country: we are given to understand, however, that a second is about to be organized, and it is to be hoped that many more may follow.

Some extracts from an article published by the present author in the *New York Medical Journal* will detail more explicitly the good effects of mountain-climbing.

"The strengthening and invigorating effect of exercise, and especially of mountain-climbing, is warmly to be commended. For the latter, by the relief it gives from the cares of business, combined with residence in a healthful locality, active respiration of pure air, and the drinking of pure water, exerts not only a transitory beneficial effect, but even, in most cases, leads to permanent cure of disease or tends to prevent its occurrence. The best inhalation apparatus, baths, and medicaments are of but temporary value, if no compensation is made for the loss of vitality and of muscular tone, especially that of the heart and blood-vessels; if the blood-stasis in the glands and other organs does not yield to an increased flow of blood in arteries and veins; if the thinned blood does not become thicker and more rich

in albumen ; if the accumulating carbonic acid is not expelled by a more plentiful supply of oxygen ; if the fat deposited in the body is not more rapidly oxidized ; and if the kidneys are not made to act more efficiently. But all these effects are produced more certainly and more promptly by mountain-climbing than in any other way. After several weeks spent in mountain excursions, the condition of the patient is radically changed for the better. There is an elasticity of the mental processes in place of the former hebetude ; will, thought, and impulse seem to move on wings ; the formerly dull senses are sharpened ; the formerly half-closed eyes sparkle, and the flabby cheeks become full and rosy ; the once prominent abdomen is reduced to more seemly dimensions, notwithstanding that food and drink are taken with greater relish ; while the chest is expanded. These changes, it is true, are not without their inconveniences to the patient as regards his apparel, for his unmentionables are found to have become much too large around the waist, while his coat, collar and shirt have grown too small. He who was before so heavy and dull now feels as elastic and sprightly as if the burden of earthly existence had been lifted from his shoulders, and, almost as in his childhood days, goes running and springing along, covering a distance of ten or twelve miles a day. He has no longer the shape of

a discontented and surly creature, a parody on mankind, but fits better in the ranks among other strong and happy beings : he is possessed of a new spirit, his pulse beats more strongly, and the tone of his entire circulatory system is better."

The value of such exercise in the cure of various diseases is more and more recognized every day. Systematic exercise of this nature is now practiced at several institutions in Germany having large tracts of mountainous land about them laid out with graded walks for the cure of heart troubles, of obesity, and even of consumption. These are intended, of course, for those who are allowed a certain amount of exercise only. For others, suffering from various forms of chronic disease, such as rheumatism, gout, dyspepsia, anaemia, and other circulatory disturbances, mountain excursions are organized under the supervision of a physician, the walking and climbing being systematically undertaken, and the progress and effect of the exercise carefully watched.

#### VARIATIONS IN INDIVIDUAL ABILITY.

Some persons possess very little constitutional power of resistance, a very slight injurious influence being sufficient to cause prolonged and severe disease. Others, on the contrary, are able to withstand many

sinister influences, and, even when their health is in some degree impaired, recover very quickly. It is well to know one's own power of resistance to such influences, and to act accordingly.

As to abilities, these are always limited in a certain sense, because a decided inclination is usually shown in but one direction and is then increased by constant study and practice. In Greece, for instance, those who practiced running were incredibly swift, while of the old Teutons it is reported that they were able to jump over five or six horses standing abreast. There are people who can swim many miles at a stretch. The cowboys on our western plains, the Csikos in Hungary, the Gauchos in the Argentine Republic, and the Cossacks in Russia excel in horse-back exercise. Contortionists, snakemen, india-rubber men, and kickers are able to turn and twist their bodies and limbs in an almost inconceivable manner, the result of long and hard practice. Again, there are laborers in Bulgaria, Albania, and Armenia who can carry as much as four hundred or five hundred pounds up the mountains. The Roman emperor Maximinian was so strong that he could successfully oppose the strength of two horses in drawing a load. There are mountaineers, who on level ground could not beat a champion runner, but who on a mountain ascent would without effort leave the same adversary far behind.

There are persons, mostly ladies, who are able to smell or taste things which no one else can appreciate. Very remarkable in this respect are the so-called pathfinders in the Argentine Republic, who, by their acute sense of smell, are able to track people, as bloodhounds do, for a great distance. The fingers of some Oriental ladies possess a sense of touch so highly educated that they can judge the weight, even of small gems, as accurately as the finest scales.

The Maoris, the natives of New Zealand, have been taught through generations to use their feet as hands, and can perform many a feat with them. So also, cripples born without arms have been known to achieve great proficiency in writing, painting, embroidering, rowing, and other exercises performed with their feet.

It is a well known fact that some people, although uneducated and in most things extremely stupid, possess the power of calculating with incredible speed and accuracy. On the other hand there have been polyhistors, men, that is, whose manysidedness is astonishing, like Aristotle, Newton, Goethe, Humboldt, Arago, and Gauss. But as a rule great men excel only in a particular branch of science or art.

## HYGIENE OF AGE AND OCCUPATION.

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### HYGIENE OF INFANCY.

To a great extent the condition of a child depends upon the surroundings among which its parents live. In large cities the majority of infants born are doomed to die young, boys more especially so than girls. This is due in but a very small degree to the delicate condition of the infants. Far more frequently the parents are at fault, although they do not perhaps sin knowingly and in many cases cannot alter the circumstances, even if they wish to do so. But even when extreme poverty and ignorance are excluded, there are a great many rules to be followed which even well-to-do people do not sufficiently heed.

It is not well to accustom a baby to too much rocking or being carried about indoors. Vomiting may result from this practice after a meal. The child should remain quietly in bed, and should be taken up only when nursing is necessary, or a change of clothing or air. Its head should not be

kept very warm. If the child perspires much about the head, a pillow stuffed with horsehair should be placed beneath.

It is a bad habit to give the child a sucking bag. This may cause sprew and even graver diseases of the alimentary canal.

The best nourishment for an infant is its mother's milk: less so that of a wet nurse, and still less cow's milk. Other nutriments than milk should be avoided, if possible; milk and milk only is required. A healthy mother will find the greatest satisfaction in nursing her own child. Even if her milk does not flow copiously during the first few days, she should not for that reason abandon nursing. "Improper feeding is in far the larger number of instances the true cause of infant mortality: the proper, the natural source of a child's nourishment is its mother's breast." Its mother's milk is drawn directly from her breast by a child, while "artificial" nutriments of every description must first make a wide and dangerous circuit. Think only through how many hands, through how many tubs and pails cow's milk must pass from the milking to the child's stomach! How many dangers attend that passage! Who does the milking? Is he sick or healthy? Are his hands clean or dirty? Who cleanses all the vessels into which the milk is poured and repoured? Of all the falsifications and other dangers to which

it stands exposed by the way we will say nothing here. The poor child, with its delicate organization, is exposed to still other dangers. Next in importance among these is the cow herself and her surroundings. Her bedding, her fodder, and similar considerations exercise a most potent influence upon the animal herself and her milk. Then too external diseases must be taken into consideration, diseases of the skin, crusts upon the udder, from which especially dirt is liable to drop into the milk. And even when the milk is finally safe in the can and has passed into the custody of the milkman, there is still the danger of the appearance of bacilli which produce putrefaction and fermentation. But the worst danger of all is the possibility of bacteria, germs of disease, being transferred in overwhelming numbers from the cow herself to her milk, and from her milk to whoever consumes it.

A newborn child does not require anything during the first twenty-four hours, and very little for the next day or two. The large amount of sugar water and fennel tea given to infants is quite unnecessary, and is often the cause of flatulence. With nursing mothers the milk appears in the breasts upon the second or third day at the latest.

The child must not be kept constantly at the breast nor placed there whenever it cries. Such a course is almost certain to disorder its digestion by

denying rest to the digestive organs, and the child in consequence becomes peevish and exacting. In regard to the frequency of **Nursing**, Dr. Jacobi says, in his circular written for the New York Board of Health :

“ Overfeeding does more harm than anything else. Nurse a baby of a month or two every two or three hours.

“ Nurse a baby of six months and over five times in twenty-four hours, and no more.

“ When a baby gets thirsty in the meantime, give it without fear a drink of water or barley-water. No sugar. In hot weather—but in the hottest days only—mix a few drops of whiskey with either water or food, the whiskey not to exceed a teaspoonful in twenty-four hours.”

In case of disease or weakness in the mother, the physician should decide upon the propriety of her nursing her child. If he thinks best that she should not do so, a **Wet Nurse** ought to be procured. This again is the physician’s duty, since it is very important to the health of a growing child that its nurse should be thoroughly healthy. The diet of the wet nurse should vary but little from that to which she has been accustomed. It should exclude all substances of difficult digestive qualities or of slight nutritive value. A moderate excess, and yet not too great a preponderance, of albuminous foods is desir-

able in order to promote the secretion of milk. To the same end cow's milk, oatmeal gruel, and barley-water are useful articles of diet, partly on account of the fluids they contain. Of the various methods recommended for increasing the flow of milk little that is favorable can be said, unless it be of the judicious application of electricity.

If a wet nurse is employed, her child should be of about the same age as the child to be nursed. Both she and her child must be closely observed and examined. The milk changes somewhat according to the requirements of the child, and the nurse should therefore not have given birth to her own child longer than six or eight weeks earlier than the birth of the foster-child.

If circumstances render bottle-feeding necessary, animal milk should be given after being warmed and made to resemble human milk as nearly as possible by the addition of water, milk-sugar, and table-salt. It may also be mingled with either barley-water or oatmeal gruel.

Jacobi advises, when there is an inclination to diarrhoea, to use barley-meal, if to constipation, oatmeal in the milk. Milk should be given in smaller quantity or wholly discontinued when diarrhoea exists. Raw albumen, with or without a few drops of cognac, may be substituted for the milk. Ready-prepared barley flour should not be used, especially

if fine and white, but whole meal should be procured and ground in a coffee mill as fine as possible, in order that it may be cooked more easily and may be rendered more nutritious. "We should be careful that barley gruel is strained till perfectly clear, and should prepare for a newborn child a mixture of one part of boiled milk with five parts of barley gruel, for very young children a mixture of one part of milk with three of barley gruel, for children from two to five months old a mixture of one part of milk and two of barley gruel, and for older children equal parts of milk and gruel." During the cooking a little salt should be added, and afterwards a morsel of white sugar. The mixture may then be given lukewarm. Oatmeal gruel must be cooked and strained in the same way.

"In hot summer weather," says Jacobi, "the food should be tested with a strip of blue litmus-paper. If the paper turns red, the food should be renewed or a little bicarbonate of soda mixed with it. A child of six months may have a little meat broth or meat tea once a day, clear or mixed with its other food; a child of ten or twelve months may be allowed a crust of bread or a morsel of half done beef to suck, or half an egg raw or soft-boiled. No sweets must be allowed, and nothing not mentioned in these directions upon any account, unless sanctioned by the physician."

Dr. Babcock, of St. Louis, says "After a prolonged and careful study of this question from the stand-point of practice, we have come to the conclusion that the milk-and-cream food advocated by Dr. Arthur Meigs, of Philadelphia, Dr. Joseph Winters, of New York, and others, is, beyond any comparison, the best artificial food for infants," especially in the colder season. "Its composition for an infant of six months is as follows : Milk, 3 parts ; cream, 1 part ; lime-water, 1 part ; boiled water, 2 parts ; and sugar of milk, 1 part. Solution of bicarbonate of soda, three grains to the ounce, may be substituted for the lime-water in case the baby is constipated. This food meets the general indication of resemblance to mother's milk in specific gravity, richness in fats, alkalinity, and sweetness. Inasmuch as milk-sugar is rather expensive, one-fourth the amount of cane-sugar may be substituted in cases of healthy children over six months of age. But with all children younger than that, and with older ones who are suffering from bowel or stomach disturbances, the milk-sugar will be found decidedly preferable."

Jacobi also recommends the addition of a little gelatine or gum arabic to the milk given to children, saying "they not only fulfil the indication of clarifying the milk and separating its particles, an important consideration in itself, but they also serve

as direct means of nutrition. They farther fulfil the conditions, for a popular and practical food, of being simple in themselves, found in every grocery, free from all humbuggery, cheap, and easy to prepare. Simple boiling in water is all that is required : for the powdered gum solution alone is sufficient."

In order to replace the deficient fat of thin milk, the same writer recommends to "add a spoonful of fine white flour to a quart of buttermilk, cook the mixture for a few minutes till a thin broth results, and finally to flavor with ten or a dozen grains of sugar. When diarrhoea exists, rice should be used instead of flour." In case of any sickness Dr. Jacobi would interdict milk altogether as an infant food.

The Bottle and its appurtenances must be kept scrupulously clean, and it is well to have more than one bottle in use, so that the most thorough cleansing may be ensured by keeping them most of the time in water. Never pour more than the quantity of milk used at one feeding into the bottle, and, if not all is used, throw the remainder away. In summer the milk must be kept on ice and warmed before using.

In order to keep milk wholly free from bacteria it must be completely removed from all possibility of contact with the air and with other substances—a matter very difficult of accomplishment. But we may proceed about it as follows :—Make a frame of

wire or wood large enough to hold as many bottles of milk as the child drinks in a day ; that should be some seven or eight half pint flasks. Place this frame in a vessel of cold water, the water not to rise above the middle of the flasks, and bring the water to the boiling point. After twenty minutes boiling stop the flasks of milk with rubber stoppers, which can be gotten in any drug-store, and remove them from the water. Whenever now the child is to drink, draw a stopper out cautiously and slip the nursing-tip over the aperture. Instead of preparing the milk eight or ten times a day and continually warming it and pouring it from one vessel into another, the food is prepared only once a day and is kept at hand ready for use. Before being emptied the bottle need, at the utmost, only be placed a few minutes in warm water. By this means it is possible also to carry children a long distance from home, taking the necessary supply of food along.

Ass's milk resembles human milk more closely than that of any other animal. Next in order stands cow's milk, which is almost exclusively used. It should be diluted at first with an equal quantity of water or gruel, later with one part to two of milk, and finally with still less. When about eight months of age a child ceases to require the addition of water to cow's milk, although gruel may still be added.

Sweet whey is the best food to give the newborn during the first two or three days of its life, the gentle laxative action of whey imitating that of colostrum in the mother's first milk, and readily evacuating the earliest tough, dark-greenish passages.

Only strong and healthy mothers, such as are not unfavorably affected by nursing, should be allowed to nurse their children, and these should constantly bear in mind the fact that in so doing they are directly responsible for the health of their children. They should avoid unsuitable articles of diet, exposure to wet or cold, great exertion of any sort, loss of sleep, and mental excitement. They should be especially careful to improve the quality of their milk by proper, nutritious, and easily digestible foods, partly animal and partly vegetable. They must also breathe pure air, must take a moderate amount of exercise every day, and must set apart sufficient time for sleeping and the absolute mental rest which accompanies it. All passions, even conjugal inclinations, should be avoided, or at least only very moderately indulged in. If some unavoidable excitement is experienced, such as fright, great joy, or grief, the infant should not be nursed for some hours afterwards, and it may even be found advisable to pump the breasts before nursing. The breasts should be kept tolerably warm, and should not be pressed by tight clothing but only loosely covered.

Neither the mother nor the nurse should take the child into her own bed. Many an infant has been smothered in this manner. The air in the bedroom should be moderately warm, but pure and dry. Strong light and loud sounds should be guarded against and strict cleanliness observed by day and night.

Weaning should take place when the child is from twelve to fifteen months old, unless some other reason, such as another pregnancy, necessitates it earlier. The appearance of menstruation is no reason to cease nursing. The first teeth make their appearance usually about the eighth month, and when the first year of life is completed healthy children have enough teeth to get along with. Weakly children and those teething late must be nursed longer than the period given above. Weaning is best accomplished gradually, and may last several weeks. A healthy season should be selected, and one in which the child can be taken out of doors.

The mother should restrict her diet somewhat, and the child should be put to the breast only half as often as before. Other liquid food, cow's milk, meat broth, eggs, should be substituted. At the last the breast should be given once a day only; and, when the day fixed upon has arrived, the child should be nursed in the morning for the last time, after which the mother or nurse should keep out of sight for a day or two, if feasible, so that remembrance of the

breast may become obliterated. If this is not found sufficient for the purpose, the nipples may be painted with a solution of aloes, a harmless preparation whose bitterness will disgust the child. If the infant should fall sick shortly after weaning, nursing may be resumed and continued for some time.

A warm **Bath**, or at least an ablution, every day is essential to a child's welfare. The temperature of the water should at first be 100° Fahrenheit, and should gradually be lowered to about 90°: the temperature of the room should not fall below 70°. The child should be immediately taken out of the bath, if its lips and fingers begin to look blue or its jaws to quiver. After every bath it must be rubbed dry and laid in a warm bed. A warm bandage is necessary, partly to support the abdomen, the navel more particularly, but also to protect the child from cold. Its clothes should always be so arranged that cold air cannot penetrate beneath them and strike upon the child's body. It is a dangerous practice too early in life to allow the child to sit erect or to try its powers in standing or walking. It is said to be possible to begin education, or rather mental training, at a very early period. Let the child cry, therefore, when you can find no plausible reason for its crying: the exercise is healthy for the lungs, and the baby should not be taken up nor humored in other ways whenever it begins to cry.

## HYGIENE OF CHILDHOOD.

After weaning, a child's diet should consist at first principally of milk, and only by degrees should custards and gruels be added until solid food is given. Meat broth in which a raw egg has been beaten up may be followed by oatmeal gruel, barley water mixed with milk, later on by rice, sago, or farina cooked in milk, and at last by finely cut meat and bread or crackers. "The child must learn never to drink its milk rapidly. The daily quantum of meat, preferably beef, lamb, or poultry, may be increased to three or four ounces, to be given in two meals." Spiced foods or drinks, coffee, tea, wine, beer, and sharp condiments, are to be avoided. When recovering from exhausting disease rich wines or malt extracts are allowable, but they are to be prescribed only by the physician. Potatoes, in whatever form, are to be given very sparingly, and so too is black bread. It is a very bad practice for parents to give their little ones a portion of everything that comes upon the table. It is much better to give the children their meals before dinner or supper time, and not to let them sit at the table at all.

Toward the end of the third or at the beginning of the fourth year of its life a child should be taught

to accustom itself to cold air and to somewhat cooler water. It is not well however to force the hardening of children in this respect. Many children have an antipathy to cold, and often it affects disastrously the brain or lungs.

Sleep is absolutely necessary to children when growing and beginning to use their muscles. They should never fail to take several hours' sleep in the middle of each day.

The child's hands should be kept from under the cover, and care should be taken that it does not acquire the habit of putting them beneath its clothing and playing with its parts. It should be trained as early as possible to announce its needs when felt.

Cleanliness should be inculcated in every respect, as to dresses and underwear, eating and drinking, and all other requirements. But we must not be too rigid and exacting in this respect. The child's play and its freedom of movement in the open air should not be allowed to be hampered. This brings to mind the story related of Emperor Joseph II., of Austria, who, when a boy, was asked by his governor what present he would most like upon his birthday. "Only let me play once the way those children are allowed to play" he answered, and pointed to a number of children digging in a large heap of sand.

The dresses should be short and should not fit tightly, the head and neck should be left entirely

free, and only against the sun, cold, and wind should protection be given. The toys should not be colored, for poisonous coloring matters might reach the child's mouth from them.

Mental training ought continually to be regarded, and it should be consistent, dispassionate, and severe, but at the same time loving words should show the child that all is meant for its own good. A great blessing, especially to parents who have little time to spare, are kindergartens after the method of Froebel.

## HYGIENE OF SCHOOLCHILDREN.

During their school years children require an abundance of good, substantial food. No coffee or tea is necessary: milk and cocoa are much more healthful. Some parents are accustomed to forbid the use of salt, of dishes which contain much fat, and the free consumption of drinking-water. This must not be overdone, since the human body requires a considerable supply of both salt and water.

In boarding-schools and other institutions the children should be dressed alike, the quality of the

goods as well as the cut and color of wearing apparel being exactly similar, in order to prevent ill-feeling upon the one side or assumption upon the other. Many of the styles worn by children at present actually encourage the passion for dress and finery, especially in girls, and show that parents do not love their children as they should. Mothers with common sense always strive to promote a taste for simplicity, which alone is really aristocratic, and thereby to prevent their daughters from holding as their sole object in life the ridiculous and unnatural passion for expensive dress, jewelry, and display, which constitutes the sole ambition of so many women.

Girls, as well as boys, should daily, if possible, take some exercise in the open air, walking, running, jumping, swimming, skating, dancing, gymnastics, or calisthenics. At least ten hours of sleep should be allowed after a day so spent.

A child ought never to be overworked by private instruction and school lessons after school hours. In school a child should not be allowed to sit in a distorted position nor without a support for its back. The utmost care should be exercised in regard to the desk a child is to sit at in school. Indeed, this subject is so important that parents ought never to fail of having their child's desk approved by a physician. Perhaps the best plan would be for the desk

to be purchased by the parents after examination by the physician ; for, as every age and size demands its appropriate dress, so each individual requires that tables and school-desks be fitted to the special form of his spinal column.

Curvature of the spine may owe its origin not only to malposition at school desks, but also to long continuance in one position, by which, from simple fatigue, a certain set of muscles becomes weak and relaxed and finally gives way. First the elastic discs yield, and later the chain of bones of which the spine is composed. Such a curve is easily straightened at first, but it becomes a "fixed fact" after a while.

Regarding the school life of children, Dr. Roosa writes "We see their little forms wasting, their soft bones bending, their eye-balls lengthening and thus producing short-sightedness from too continuous employment in the school-room, and over the study-table at home, but our advice is not asked until the deplorable consequences are painfully evident. Even then the great anxiety of parent and teacher, an anxiety often yielded to by the physician, seems to be, not to get and keep the child in a physiological condition, but to enable him to go on, without any interruption of his very important study of books—the incorrect notion being held that education consists wholly in the study of printed words. We are sent for when the defective sewerage, the leak

in the waste-pipe, the over-crowding and insufficient ventilation and lighting of the school-room, the want of physical exercise and food, the excessive employment of the brain, have done their work, and we have to deal with a febrile, short-sighted, catarrhal, and puny patient. We are expected to cure the fever, to put glasses upon the eyes, and set the poor machine at work again, without a remonstrance against the system that has produced all this misery. We have not until very lately been asked to look after the public and private school-houses, to see how the seats are constructed, or the rooms lighted and aired, to examine into the drainage of the college grounds, to prescribe the diet and the proportionate hours of study and exercise. Perhaps we should not all know how to perform these duties well, were they required of us, but they will certainly be among the functions of the coming medical man."

The air of the room should neither be allowed to become impure, nor to be too hot or too cold. The clothing worn should be very loose about the limbs and body. In winter all outer clothing must be of wool. But no winter is so severe as to excuse the use of heavy woolen hoods and fur caps. It is important that clothing should fit well both upon small and larger children.

## HYGIENE OF YOUTH.

The phases of development at the age of puberty demand especial attention. Sex begins now to manifest itself, and must be taken into consideration in all its aspects and in every connection. Growth and a certain tendency to rounded forms advance very rapidly in female children, while the various organs develop gradually to their proper form and size. In young men the chest and the muscular system develop most largely, in young women the hips.

It has been observed that girls who are late in beginning menstruation retain their youth and health longer in later life and even as a rule live longer. These blessings may be secured by introducing girls only as late as possible into society and by treating them as children as long as may be. It is well for a mother to prepare her daughters for the symptoms of puberty. No steps should be taken however to accelerate its appearance.

The diet at this period should be simple and unirritating, but very substantial, easily digestible, and ought to contain a sufficient amount of fat as well as a proper quantity of salt.

The education of both mind and body in a growing girl should have as its principal object her destination as a wife and mother. It would be of great

advantage to every young woman and to her future offspring, if she would visit orphan asylums, nurseries, and kindergartens, and there make practical studies in education.

A cultured lady should be able to understand the usual topics of conversation in society, the various aspects of life, and the interests of humankind in general. She may not perhaps be able to advance a decided opinion, but she should be capable of following and inclined to follow conversations upon subjects of general interest, and to participate, if needful. She ought at this period, therefore, to be furnished a good general knowledge of the tendency of human endeavors and of their practical results, of the progress made in the various branches of art, science and morals, and of the marvelous discoveries and wonderful inventions of the human mind,

#### HYGIENE OF ADULT LIFE.

When fully developed, the system at length comes to a standstill, so to speak. It shows however a decided staying power. An adult man or woman is capable of enduring exertions and privations for

a time without great detriment ; but, if these are constantly experienced, they show their effects by causing premature old age.

Although we might suppose that middle-aged persons are the most sober and sensible, many of the simplest rules of hygiene are continually sinned against by them. Protracted mental and bodily work without sufficient periods of rest, unbridled passions and desires of various kinds, unnecessary dosing with all kinds of medicine upon the one hand, and disregard of real symptoms of disease upon the other, overfeeding with meat and other rich dishes, drinking too much of strong liquors instead of a sufficient amount of water, too little bodily exercise with too much ease and leisure—these are examples of the incorrect methods of living but too prevalent during middle life.

#### HYGIENE OF OLD AGE.

Since sexual life becomes extinct with advancing age, men and women do not require separate consideration : the rules of life they find it necessary to conform to apply to both sexes,

In order to attain to advanced age disease must be avoided in early life. As a rule those who have lived one hundred years or more have rarely been sick during the earlier periods of their lives. From this it will be seen how advantageous it is to be moderate and to live regularly at all times. In saying this we have reference to eating as well as to drinking, to conjugal desires as well as to mental and bodily work. Overwork is always hurtful and foolish, especially when it is permitted simply for the sake of money getting. It is in the middle walks of life that we find the larger proportion of men who are sound in body and mind ; for here all have sufficient wealth to enable them to lead healthful and agreeable lives, full of rational and instructive pleasures. Anything that tends to exceed moderation is inevitably injurious. Great wealth always leads to great temptations, and to enjoyments which are hurtful and destructive in their tendencies. The glitter and the vainglory which it fosters are as injurious to man as are the lanterns of high light-houses to wandering birds : we run our heads against them till we are sorely bruised and battered. It is a spectacle both tragical and comical to see rich men toil and moil for greater wealth until loss of health deprives them of the possibility of enjoying their gain. Even when sickness comes and death threatens many refuse to retire from the cares of business and

to live at ease. The prevalent cause of premature old age to-day is waste of vital energy, in sexual desires especially, but quite as much in overwork, in late hours of work and enjoyment, in want of proper food and rest, and in the immoderate drinking of alcoholic beverages.

Old age brings varied troubles—catarrh of the lungs with the attendant cough, catarrh of the stomach and bowels with loss of appetite and diarrhoea, apoplectic attacks from the rupture of blood-vessels in the brain after age has hardened them, uræmic blood poisoning from kidney troubles, senile gangrene attacking the extremities. One point to be kept always in view in caring for aged people is this, that any sudden change in their usual mode of life must be avoided. The idea that hardening and strengthening is good for them is wrong: on the contrary these are actually injurious. Old people should be content with the modicum of vital energy and health they have retained after middle life. They must accustom themselves to their enfeebled condition, and must not try to increase their vital powers, but rather to retain them and to utilize them most economically. Muscular exercise and strenuous mental effort are as injurious as strong excitements, and of the latter the most injurious are those of a disagreeable and those of a sensual nature. Old people do well to associate with the

young and with children ; they should seek society and diversions of a hilarious nature. Their food should be nutritious, but simple and easily digested : it ought to be spiced with some of the milder condiments : it should consist of broth, beef-tea, eggs, jellies, oysters, good hash of fresh meat, juicy roasts (game and poultry preferably), and such beverages as cocoa, milk, and coffee with cream or with an egg beaten up in it. A glass of good rich wine may be taken with every meal.

Old people frequently suffer after a tolerably full meal from some gastric disturbance. They should therefore eat but little at a time, should rather eat oftener than others, and should shun everything hard, tough, or fibrous. Many die at the threshold of old age, much earlier than would seem necessary, simply because they do not restrict their diet, and because in consequence their circulatory and other organs are overburdened with work from the addition of superfluous material to the blood.

The clothing of old people should be warmer than that of younger persons, since their bodies produce less heat, and, like children, they thrive better in warmth. During cold weather more old people die than during the heated season, and those not adequately clothed more readily succumb than those who are warmly dressed. Warm baths and ablutions followed by gentle friction are very neces-

sary on account of the diminished action of the skin.

Old people often suffer from wakefulness. In order to induce sleep their bedrooms should be quiet, spacious, airy, and moderately warm. They should lie with heads considerably elevated. They must be warned very decidedly against heavy meals at night, excitement before retiring, and anything else likely to induce apoplexy.

## HEALTH AND MORALS.

To the attainment and preservation of beauty not only are thorough and rational hygiene of the skin and hair requisite, aided by bodily exercise, but, aside from these external influences, the impress of the mental and moral atmosphere in which the individual lives, the kind of work he is engaged in, his virtuousness or voluptuousness, all these and other influences stamp themselves upon his features and assist in making him appear noble and beautiful or low and ugly, as the case may be. Excesses, passions, and unnatural habits can, as a rule, be read in the features, and tend to make them appear uglier

and older. Every man is responsible for his own treatment at the hands of his fellows. He who deals hardly and proudly with other men will be sure to receive no kinder usage in return. He who is indulgent and liberal to his subordinates will be loved by them and will receive affectionate service from them; while he who is indifferent to the welfare of dependents embitters his own life far more than he supposes. A cheerful mind contributes much to tranquillity of life. So long as we are healthy and happy, we need have little dread of epidemics, even of typhus and cholera. The general character of an individual is dependent upon physical conditions just as much as it is upon his moral surroundings, upon the early impressions he receives, or upon the various influences for good or temptations to evil which he meets with. A mind free from low egotism and full of noble impulses is one of the best guarantees of bodily health. People who carry clear consciences sleep soundly and digest well as a rule. The favorable influence of a quiet, self-contained mind is a potent factor in the restoration of health, for it is a well-known fact that care and trouble, particularly when actual want is threatening, not only depress the mind, but sometimes interfere with convalescence, and may even be the indirect cause of such diseases as cancer, diabetes, heart disease, consumption, and, most dreaded of all, of melancholia, gen-

eral paresis, and other forms of insanity. How rapidly emotions may take effect we see from the closeness with which they may be followed by severe diarrhoea. In a certain portion of the East Indies it is customary to place rice in the mouths of those suspected of any theft. He in whose mouth the rice remains most dry is considered the thief, experience having shown that emotion reduces the discharge of saliva.

The best way of securing mental quietude is to possess a clear conscience. The feeling that we have always done our duty so far as lay in our power is in this respect of the highest importance. Since "charity begins at home," we should first of all fulfil our duty to our own family. It is not necessary that a husband and father should bestow upon his wife and children all the luxuries wealth affords, but it is of great importance to remember that a time may come when he can no longer provide for them; and if he should be taken away from them earlier than he expected, he will take satisfaction in knowing that "the wolf cannot approach the door." A life-insurance policy for a good sum issued by a company of high standing is the best means to this end, and the sin of such an omission should not be allowed to embitter the last moments. When in possession of such a policy, death will appear less dreadful, grave diseases will be more amenable to

medical treatment, and the probability of early convalescence will be increased.

In the foregoing passage we have advocated life insurance as a provision against the time of death. But life insurance companies too, it may not be out of place for us to say here, owe a duty to their patrons, the discharge of which is conducive to the equanimity of the individual both in health and disease. Quite as much for their own protection as in the interest of their patrons they should do their utmost to promote the sanitary well-being of policy-holders, by using their great power and influence, and even by direct efforts, to bring sanitary measures to adoption everywhere and in every possible respect. Even if the benefit of such a policy was confined to their own patrons, a very grateful field of labor would lie open to them. But the effect of their endeavors could not be so limited in most instances. Nor would it be well, were such a limitation possible. For a partial enforcement of sanitary laws is not sufficient to prevent the occurrence of an epidemic or even to limit its spread, and consequently the insurance companies and their patrons could not by restricted precautions escape being affected.

## MARRIAGE.

Matrimony exercises a very favorable influence upon the duration of life, probably on account of the regular and systematic methods of living induced, and the consequent protection against disease. When attention is paid to the laws of heredity, marriage is capable of serving for the physical and psychical improvement of the human race. The highest form of matrimonial selection is the "psychical selection" of Haeckel, in accordance with which the spiritual and moral preferences of one sex are aroused in response to those of the other.

No less regard must be paid to the condition of health of the contracting individuals and of their families, for we know that certain diseases, insanity, cretinism, epilepsy, consumption, and others, are frequently inherited. Intemperance in the parent not infrequently precedes mental disease in the offspring. Most lamentable is the result when a disease exists in both families. The feeble and diseased who renounce marriage in obedience to the dictates of reason, especially those whose hearts warm toward humanity and who know how to employ their powers in some useful activity, not only act in obedience to higher motives, but also secure greater happiness to themselves, than if they became the parents of a

sickly and miserable progeny. If such individuals must marry, it is more humane and more desirable for the race, that a union should be entered into between two unhealthy persons than between one who is diseased and one who is sound, for in the former event the vitality and the sufferings of the offspring will be reduced to a minimum and there will be less danger of the human race being vitiated with a diseased progeny.

Among many species of animals a selection of the fittest takes place, in accordance with which union is the reward of the strongest as a result of passionate struggles between rival wooers. Domestic animals too are often submitted to a similar selection, in making which their owners endeavor to couple the most serviceable and the finest animals. But very many parents act less sensibly. It should at least be their duty to institute an examination into the health of a daughter's suitor, either by direct inquiry upon the part of the family physician, or indirectly by compelling him before marriage to effect an insurance of his life in some company of acknowledged standing. Such a course furnishes the young wife **not only** a guarantee of her husband's health, but also that of a maintenance provided in case of his death.

Surely the attraction of the more prominent mental, moral, and physical qualities is a nobler motive

than that of wealth. From such a choice alone springs the harmony of an unsullied happiness, and so only may two beings be bound together, soul and body, in a pure and affectionate unity of sympathies. What we say is not mere sentiment, but is intended to be literally understood ; for gradually the qualities of a husband become impressed upon his wife, and not infrequently the child of a second marriage bears traces of its father's predecessor.

## HYGIENE OF THE WORKSHOP.

We have already observed that the muscular system ought not to be overworked. Not only is this rule applicable to the system as a whole, but individually to each of its parts, notably to those which are especially active in certain occupations. In order, after labor, to be restored to its normal condition, the body must have sufficient rest and proper food.

Children and young people under seventeen years of age are much more sensitive than adults to the injurious influences which abound in shops and factories. No one should begin work without previously

consulting a physician, and the first step in every occupation should be to familiarize one's self with the different substances to be employed and with the measures possible for protection from dangerous influences.

Whether a man works with his head or his hands, he should be conscious of the fact that frequent changes of position are most desirable. It is exceedingly injurious to sit or stand for hours at a time in the same posture with the body bent and cramped together. Handworkers especially should be careful to keep their heads and bodies upright and their chests free and straight. The choice of a proper seat is therefore important. The angle formed by the chest with the table or workbench should approach as nearly a right angle as possible.

Work rooms should be well lighted and thoroughly ventilated. Before the latter is done water should be sprinkled or damp sawdust strewn about and the floor swept clean in order to prevent dust and other noxious particles from being whirled about in the shop. Where such harmful substances are present it is advisable to wear a respirator or a mask filled with cotton dipped in glycerine.

**Lead** and its preparations are substances very injurious in many instances to workmen. The lead is absorbed into the system by inhalation as well as by being swallowed involuntarily in the form of dust,

and sometimes large quantities of it are eaten with their food by painters and others who neglect to wash their hands thoroughly at the dinner hour.

**Mercury** may also enter the human body through the skin in the form of vapor.

**Arsenic** is a poisonous chemical very frequently used in industrial processes.

**Copper** is contained in bronzes and certain coloring matters, in the dyes used with candies and other eatables, and also in some of the paints applied to toys.

The vapors of **Phosphorus**, to which those who work in match factories are exposed, are very hurtful, and especially so in view of the poor ventilation usual in such places, while the antidote, ammonia, is not provided by employers. All workmen liable to exposure in this respect would do well to observe the strictest cleanliness, and never to take their meals in the workshop. They ought to give up work or to change their occupation as soon as the first bad symptoms show themselves.

As a defence against **Carbonic Oxide** and other gases which are developed in the course of certain manufacturing processes it would be best to allow such processes only in the open air.

Care must be taken by all who are exposed to **Animal Poisons**, glanders, the poisons of dead bodies, and that from sausages, and by those whose

occupations oblige them to handle corpses, meat, or sick animals, as well as by those who work in skins, hair, bristles, and other animal products, that their hands are kept constantly covered, especially when even a slight abrasion of the skin exists. This rule applies in particular to physicians, undertakers, veterinary surgeons, butchers, cooks, shepherds, farmers, tanners, furriers, and soap makers. The necessary protection to the hands may be obtained by wearing rubber gloves, or by oiling the hands well and washing them in a solution of hypermanganate of potash.

Workingmen often fall sick because they do not live rationally and do not breathe sufficiently pure air. Their homes are in many instances unhealthy, they are apt to neglect cleanliness, and for the most part they do not eat proper food. A workingman who follows out sensibly the rules we have given will find himself better off, without any additional expense, than his fellows.

The most healthful occupations are those which require an out-door life, or which are followed at least in a fresh, pure air. Preëminent among these may be named gardening, farming, and cattle-raising. Of course such a rule has some exceptions, and, especially in a country like ours, where thousands of acres of virgin soil are broken every year, the exhalations from the ground, to which we trace

so many cases of chills and fever, must be kept constantly in mind. Those regions where malaria exists, even in a moderate degree only at spring and fall, cannot be healthy until a thorough system of drainage has been established.

Living in the country where malarial fever abounds has ruined the health of many a man, woman, and child. In selecting a location, therefore, the mountains ought to be preferred to the open country, other things being equal. Furthermore, persons subject to bronchial and pulmonary troubles can hardly do better than to choose the mountains.

## HYGIENE OF THE DWELLING.

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Dwelling-houses and apartments should be ensured sufficient light and air and a moderate temperature. They should be dry, not damp. Pure, fresh air is of paramount importance in relation to the preservation of life and health, for only in a pure atmosphere can our blood be purified by respiration. About half a pint of air is inhaled with each respiration and as much exhaled. It is a sad fact that the dread of fresh air, under the name of "a cold draft," is so general, and especially that it is encouraged by some physicians. Cold drafts can be harmful only to overheated and perspiring persons. The statement, "I have caught a cold," very frequently serves to disguise a variety of disease-producing causes which may justly be laid at the door of the speaker himself.

Compliance with nature's demands always produces a feeling of agreeable relief. What a similar sensation accompanies the exhalation of noxious matters from the lungs and skin we can appreciate only when these processes are interfered with. We should as little think of consuming again the exhalations of our skin and lungs as we would our own

excretions. In the year 1848, during a severe storm, the captain of the steamer "Londonderry" confined his two hundred passengers in a hold which scarcely afforded them standing-room, and sealed the hatches. Forced to breathe again and again the same air, the miserable inmates soon found their situation intolerable, but contrived to force an exit only after seventy-two of their number had expired from suffocation. Nearly a century earlier their commanding officer had graphically described the intense suffering of the one hundred and forty-six British soldiers confined in the Black Hole of Calcutta—their profuse perspiration, their raging thirst, their labored breathing, their rapid heart-action, their starting eyes, their frenzied struggles to reach the two small windows, their agonizing cries for water and for air, their delirium, exhaustion, death. After ten hours of such scenes twenty-three only of the number were taken forth alive. These casualties were consequent simply upon the insufficiency of oxygen and the inability of an already saturated atmosphere to absorb the exhalations of so many bodies.

Frequent change of air by efficient ventilation is not sufficiently practiced either on behalf of the sick or of the well, although abundance of fresh air is well known to favor health, while its absence both causes and aggravates disease. In the Leopoldstadt prison of Vienna, a building very badly ventilated,

the death-rate during a certain period was eighty-six per thousand, the larger number by far from lung diseases : in the well-ventilated House of Correction in the same city the death-rate was only fourteen per thousand, and little more than half of these from lung complaints.

The oxygen of the atmosphere is the most potent disinfectant for our bodies. In farmhouses we often see bedrooms made use of as wardrobes as well as for sleeping purposes, dresses and clothing being suspended from the walls and ceiling. No more favorable means than this can be imagined for the collection and distribution of disease-germs ; and it is a fact that we often see epidemics of diphtheria, typhoid fever, and other infectious diseases, spread with remarkable rapidity among a farming population.

The great value of ventilation is forcibly illustrated by an occurrence observed in Brooklyn in the year 1885. During that year an epidemic of typhoid fever, limited in area to but a few blocks, broke out in the southern part of the city. Many died of it, but only those were fatally attacked who had been in the country during the preceding summer months. In the adjoining blocks, inhabited by a poorer class of people, who had remained in the city, no fatal cases occurred. The reason for this partiality of the fever is easily learned. These well-to-do people,

before leaving town, had closed up their houses almost hermetically. The gases which emanated from the sewer-pipes had become fixed, so to speak, during their absence, having no channel of escape, and even after the return of the occupants ventilation had not been well looked after. In these houses consequently the germs of disease had found a fertile soil for their development, attacking their victims with such vigor as to overwhelm them. The neighboring poor, however, had not been away, and their rooms had been constantly ventilated, so that disease germs found it hard to thrive there.

Ventilation must be thorough and frequent. It does not suffice to open the windows a little at the top and a little at the bottom, nor even to open but one of them fully. All in the room should be thrown wide open above and below, so that not only fresh air can come in, but the foul and vitiated air of the interior can escape. The badly fitting doors and windows of their dwellings afford poor people better ventilation, even in winter, than they are otherwise likely to enjoy, not a bad thing upon the whole, if only the house is not situated upon ground too low and damp.

It is wise to pursue two methods of ventilation conjointly. In the first place, as many windows and doors as possible should be thrown widely open for about an hour each evening before retiring, and

again in the morning after the gentlemen have gone to business and the children to school. The draft thus created may bring in some dust to settle on the fine furniture, but this is easily removed; and the fact remains that the foul air of the room has been dispelled and with it all disease-germs adhering to walls and hangings. Just as violent atmospheric disturbances are necessary, particularly to large cities, in order to dissipate the thick vapors constantly hovering about, so also must our houses be subjected to like violent measures of ventilation.

A quieter method of ventilation is to be followed, in the second place, by constantly admitting fresh air through windows kept always a little open at top and bottom. This need not create any draft, but will simply promote continual interchange between the inner and the outer air. The same end may be attained by closing the shutters on fully opened windows. Noxious gases and vapors, dust, and smoke, must of course be guarded against.

**Fumigation** with aromatic compounds is of little value. It conceals disagreeable odors, but cannot change bad air for good.

The air and water which permeate the soil demand our careful consideration. They are supposed to exercise a strong influence upon epidemics of infectious diseases, like cholera and typhoid fever. In building a house, therefore, the condition of neigh-

boring **Sewerage** should be closely regarded. No surface water should be allowed to collect about the foundations. All cesspools should be situated as far from the house as possible, care being taken to place them on a lower level than the house : otherwise the soil surrounding the house will become saturated with effete matters and will afford a favorable nidus for the development of disease-germs. Wells must be very far removed from cesspools.

Pettenkofer has shown that the daily excretions of an adult amount to about three pounds of solid and liquid matter. If no complete system of sewerage exists in a large city, his experience has taught him that hardly one-tenth of these effete products is actually removed. The other nine-tenths decompose and filter into the ground, the more so, the lower and damper the locality. This has been illustrated numberless times by the circumstances attending the spread of epidemics of cholera and other infectious diseases. On high, dry, and rocky ground these diseases are very rarely encountered. Sandy ground may also be held to afford a healthy foundation, since it prevents decomposition of contained matters. Senator and Flügge have found that one volume of sand will absorb and hold two hundred and fifty volumes of sewage.

Koch, however, modified Pettenkofer's view by showing that the ground serves also as a filter, the

bacteria remaining for the greater part in the upper layers, while the purified liquids descend to lower levels. From the surface of the ground these germs are washed almost completely away, either by water flowing over the surface, or by showers of rain, and, collecting in streams and wells, originate through drinking-water a new source of infection. Hence a gradual, but constant decrease in mortality followed the introduction of sewerage into München, the classical typhoid city of Europe, and into Calcutta, the breeding-place of cholera. Upon the development of tuberculosis, too, the purification of the ground exercises a retarding influence, for since the draining of the site of München and since the introduction of a pure water supply into that city, the mortality of consumption has diminished by a full third.

From a bacteriological point of view, admixture of sewage with a water can be injurious only when that sewage contains noxious bacteria. If, through any process, the sewage be freed from such bacteria, it will be deprived of all bacteric infectious qualities. The most common natural process by which sewage is freed of bacteria is filtration through the soil. If all the bacteria are removed, the sewage can contain no pathogenetic species, but if they are not all removed and the sewage passes into a water supply, the latter will be in danger of infectious contamina-

tion so soon as the sewage contains pathogenetic bacteria.

A veritable pest-hole exists in the cellar of many a house otherwise healthily constructed. When dark and damp, as so often is the case, and especially when made the repository of fuel, ashes, refuse, and decaying vegetables and fruit, it furnishes a most favorable spot for the propagation of noxious germs. As a matter of fact no part of the house demands more frequent inspection or more thorough airing. Its air is constantly passing, through the floors as well as by way of chimney-flues and air-shafts, to the apartments above, and, unless constantly renewed, carries with it all manner of deadly influences.

The supreme sanitary importance of the removal of all **Sewage** in order to prevent the development of disease-germs is self-evident. Several systems have been proposed for this purpose. Among them we note the barrel system; the pumping system, which is in general use in France and Belgium, and which is quicker and safer than the barrel system; the sewer system, which is best as put in practice in Berlin. By means of large pumps the sewage is raised from the sewers and poured over a large tract of land, upon which it spreads, and from which it runs off, after depositing its excrementitious matters. Although it has been in operation for only a

few years, this system has proved remunerative, the farmers consenting to pay good prices for the offal thus collected. In this way matters usually found injurious by the inhabitants of other cities are turned to account by the people of Berlin.

Where the removal of excrement cannot be accomplished systematically and thoroughly, care must be taken in regard to the arrangement and disposition of the closets, particularly with a view to the condition of the ground. Decomposition progresses very rapidly, and the gases and exhalations produced are often repulsive in the extreme. Gases spread very readily underground, as has been repeatedly seen in cases where illuminating gas, escaping from the mains, has entered cellars, basements, and even higher floors of houses. In some of these no gas-pipes or fixtures existed at all, and still the inmates fell sick from inhaling gas because a gas-main in the neighborhood had burst.

The principal hygienic rules to be observed in the interest of **Domestic Disinfection** are the following. The great danger of sewer gases entering our dwelling houses is best averted by opening a connection between the sewer pipes and a chimney. This furnishes an exit for the gases generated in these pipes, gases whose lightness tends to force them upward, and which escape the more readily if a fire is burning in the range or fire place below. By this means

the offending gases are either destroyed by fire and smoke within the chimney, or else are dissipated over the roof without finding an opportunity to cause sickness. The pipe must not enter the chimney upon a lower floor than another opening, nor even in its immediate vicinity.

Among the most dangerous appliances in a modern house are the stationary washbowls and the bathrooms in its upper stories. Traps are wholly insufficient for their intended purpose. A better way of keeping gases out of the room, aside from the arrangement detailed above, consists in closing the drain-hole at the bottom of a tub or basin so as to keep water always standing there.

George E. Waring, Jr., in his article on "**Drainage and Sewerage**," makes the following remarks : "Running water confined within a narrow channel, and so compelled to move with force sufficient to give an energetic scouring to the walls of its conduit, may be trusted to carry with it or to drive before it pretty nearly all foreign matter that may have been contributed to it ; but the moment this vigorous current is checked, that moment the tendency to excessive deposit begins. It is checked in practice in various ways ; first, by too great a diameter of the pipe ; second, by the use of traps larger than the pipes leading to them and from them, thus increasing the natural tendency of all traps to stag-

nation and deposit; third, by the use of vertical water-pipes, which are almost universal and which are very often necessary. The velocity of a current, measured along the axis of the pipe, is less, if the direction is vertical, than if it is laid on a steep slope, because of the tendency of liquids flowing through vertical pipes, which they do not fill, to adhere to the walls and to travel with a rotary movement. This latter point is rather one of curious interest than of practical value.

“However defective may be the condition of an iron soil-pipe, vertical or horizontal, it is perfection itself compared with the usual state of a drain laid under the cellar floor. Under all circumstances, at least in all work hitherto executed, one should demand as absolutely necessary that the drains under the cellar floor be removed, that the earth which has been fouled by the leakage of its joints and its breaks shall be taken out to the clean, untainted soil below, and refilled with well-rammed, pure earth or with concrete, the drainage being carried through a properly-jointed iron pipe above the pavement, and preferably with a fall from the ceiling of the cellar to near the floor at the point of outlet—in full sight for the whole distance. It sometimes happens that the necessity for using laundry-tubs or other vessels in the cellar makes the retention of an underground course imperative. When retained,

the drain should be of heavy cast iron, with securely leaded joints, tested under a head of several feet. When found to be tight and secure, it should not be, as ordinarily recommended, left in an open channel covered with boards or flags and surrounded by a vermin - breeding, unventilated, and uninspected space, but closely and completely imbedded in the best hydraulic cement mortar. Its careful testing before this enclosure is of course the only condition under which the work should be permitted."

We would add, however, that the very best plan for securing freedom from sewer gas in the dwelling is to relegate the bathroom and all pipes connected with the sewers to a small separate building, which may be connected with the house by means of a long covered passage. This passage must be thoroughly ventilated at all times, and the doors opening from either end must be kept constantly closed. Glazed stoneware or earthenware pipes are to be preferred for house-drains, and should be laid in well-puddled clay or in concrete.

To demonstrate the influence of sewer gas on the general health of a community, the returns of the Registrar-General of Great Britain are cited by several authors. In the year 1847 an order was issued to connect the privies in the City of London with the general sewerage system, thus creating a direct communication between the rooms of all the houses and

the public drain. The mortality increased fourfold, as is shown by comparing the statistics of a number of years preceding 1847 with those of a series of years following. This increase, or at least a large part of it, can be traced directly to the effects of sewer gas, and to the poisoning of the well water, particularly to the former.

Where earth closets take the place of sewers, a shovelful of earth should be thrown over each defecation. The best earth for the purpose consists of dry clay, two parts, and loam, one part. Dry mould or coal-ash siftings may also be used. Green vitriol should be thrown in, when an epidemic is threatened or very hot weather prevails.

**Disinfection** is to be accomplished by means of antiseptics, notably fire, boiling water, chloride of lime in solution, corrosive sublimate, sulphurous acid, green and blue vitriol, carbolic acid, chloride of zinc, the mineral acids, and chlorine. It is best to use one of the first four mentioned, following it up with one of the others. Carbolic acid Koch has found capable of stopping the development of micro-organisms when diluted with four hundred parts of water, and corrosive sublimate in a solution of the strength of one to three hundred thousand. The former, a product of coal-tar, is a clear, colorless, oily liquid, which blisters the skin severely in a few moments, is extremely poisonous, and rapidly proves

fatal. The fact is to be noted that pure carbolic acid is not so good a disinfectant, and does not destroy bacteria with the same certainty, as when diluted with water; and, furthermore, that it displays its disinfecting properties to best advantage when in combination with water in the proportion of ten parts in the hundred. Corrosive sublimate in concentrated form is also a violent poison, and it may be reckoned a great blessing to mankind that it suffices to destroy bacterial life in so attenuated a solution as to threaten no danger to the human organism. A sublimate solution of one in five thousand, which will infallibly destroy bacilli, and which fully suffices for most purposes of disinfection, is nevertheless less poisonous than a five per cent. carbolic solution. In many hospitals a trial of other disinfectants, such as boric and salicylic acids, creolin, thymol, and salol, has resulted only, when a thorough destruction of micro-organisms was demanded, in a return to one of these two principal agents.

Articles to be disinfected must be spread out, not left packed up in a bundle. Corrosive sublimate attacks most metals in common use, and must therefore not be poured into leaden pipes. A concentrated solution of corrosive sublimate contains four ounces of the chemical in a gallon of water. By adding ten grains of permanganate of potash or a pound of blue vitriol the solution is colored and rendered recogniz-

able. This solution should be left to act for about two hours. Boiling water takes effect in thirty minutes. Sulphurous acid is most efficacious in damp air.

The **Dejections** of a patient suffering from any infectious disease should be disinfected before being thrown into the closet, especially those from cholera, typhoid, or yellow fever patients. In the same manner the vomit and the sputum of patients suffering from cholera, diphtheria, scarlet fever, and consumption should be disinfected, as well as the receptacles used about the sick-room.

Chloride of lime is the best disinfectant for excrementitious matters. A little should be kept constantly in the chamber-vessel. A solution containing eight ounces to a gallon of water is most serviceable, and is to be stirred with the contents of the vessel immediately after use. Cholera dejections must be disinfected for four hours with a five per cent carbolic solution. Napkins, towels, and other fabrics infected with disease germs should be burned or thrown into a two per cent. carbolic solution, or into one of chloride of lime. The latter is an appropriate disinfectant for physicians and nurses to wash their hands in. Bandages should under all circumstances be thrown away, or, still better, burned.

**Beds and Clothing** are best **Disinfected** with a

solution of corrosive sublimate, of the strength of one part in two thousand of water, or with a two per cent. carbolic acid solution. Wearing apparel must be exposed to the action of steam for thirty minutes, and afterwards spread out or hung up to air.

To fumigate and disinfect sick-rooms, houses, and ships, sulphur is usually burned. Several pounds in broken pieces are thrown into an iron vessel, standing, for fear of conflagration, upon bricks in a vessel filled with water. Alcohol is poured over the mass and the match is then applied. The doors and windows should be kept tightly closed for many hours, while the sulphurous acid developed by the burning sulphur does its work. To ensure thorough efficacy the room must contain an abundance of watery vapor before the process begins. Sublimate may be used in the same manner, a pound being usually sufficient. The mercurial vapors developed are more deadly in their action than those of sulphur. A pan of burning charcoal must be placed beneath the vessel containing the sublimate.

**Valuable Furniture** may be **Disinfected** by exposure to fresh air for at least a month. Carpets, curtains, and furniture are best removed from the sick room at the outbreak of disease, only such of them being retained as can be easily disinfected. A

solution of some reliable disinfectant should then be prepared and kept always at hand ready for use when required.

Mattresses should be opened, and the hair steamed and then picked and exposed to the air. It is well to rub floors, walls, and articles of furniture with a rag saturated in a solution of carbolic acid, chloride of lime, or corrosive sublimate of the strength already given. Sick rooms ought to be fumigated several times with sulphur or sublimate, and then thoroughly ventilated. Walls are best disinfected by rubbing them, as Professor Esmarch recommends, with stale bread. If the walls are papered, it is safest to strip off the paper entirely.

The **Disinfection of Cesspools** must be accomplished by the use of such antiseptics as dry earth, pulverized charcoal, chloride of zinc, green vitriol, or, best of all, by a one to five hundred sublimate solution. Cesspools must be emptied very frequently. Every part of a privy, and especially the woodwork, should be thoroughly washed with the sublimate solution, after which dry sand should be scattered about, or a powder consisting of one part of chloride of lime with nine parts of plaster of paris.

In order to be healthy a house must be kept dry and clean. Odds and ends lying about are not only disgusting to an eye used to order and neatness, but they may in times of epidemic become active agents

in fostering the germs of disease. Soiled dishes and remnants of food are equally inimical to health and to cleanliness. Meat, milk, flour, and similar articles of food, if not kept in an ice chest or meat safe, should not at least be left uncovered.

It is always harmful to live for any length of time in rooms that are damp or cold, rooms having walls dripping with dampness or floors wet from scrubbing, and rooms where clothes are hung to dry. The more moisture the air contains, the less capable is it of absorbing the vapors of our breath and with them the disease-germs we sometimes exhale. These are then partially retained, and impede the inhalation of pure air rich in oxygen. This interference with evaporation from the lungs and skin is very hurtful. It renders difficult the cooling-off process which our bodies constantly require, it almost arrests and quite neutralizes the activity of our skin, and interferes with the purification of the blood. The best proof of these statements is found in the distressing influence of so-called "muggy weather," when the temperature of the air is not excessive, but the humidity of the atmosphere is considerable. Dry heat at from ninety to one hundred degrees Fahrenheit is easier borne than temperatures below ninety degrees when the humidity is at the point of saturation. Damp air which is at the same time cold is more objectionable than damp warm air. On the

other hand very dry air in living-rooms is very unhealthy. This condition is particularly found in rooms heated by steam, by hot water pipes, or in those heated by means of a furnace, a heater, or even a common stove. A vessel containing water should be kept in every such room upon the stove or near the register. The air heated by a furnace should pass over water before entering the room.

Its **Situation** is a most important factor in the choice of a dwelling. The climate, the direction in which it faces, its altitude, its location upon a hill-side or in a valley, the neighboring rivers, ponds, lakes, swamps, and marshes, whether upon dry, sandy, or rocky soil, all these features are to be considered. The severity of the sun's rays, the prevailing direction of the wind, temperature, and humidity vary in different localities. Rooms facing south are warmer, but subject to greater changes of temperature; those facing north are cooler, but preserve a more equable temperature. Houses situated in deep forests or lying between dense clumps of large trees are apt to be unhealthy from dampness. But a wood at some distance from the house is an advantage, since it furnishes abundance of oxygen besides protection from wind and excessive heat.

Walls built of porous stone are in themselves an excellent means of ventilation, and are moreover dry, while brick walls absorb a large amount of water

and retain it for a long time. Houses situated on wide streets are lighter and afford better air and more freedom from dampness than those built on narrow streets. Detached houses are for a similar reason preferable to those built in blocks, and an advantage is also found in freedom from the too close proximity of shade-trees.

It is very desirable that the roof of a house should be available as a resting-place upon summer evenings, in the old Roman way, and especially is this true of malarial districts, since, the farther we are removed from the ground, the less is the fear of infection, although upon damp evenings it will be found better to avoid the open air even upon the roof. Wooden houses should be painted with a light color, and, if possible, some creeping plant should be allowed to climb the walls as a protection against the fierce rays of the sun.

No dwelling should be situated within an eighth of a mile of a **Graveyard**. Still more important is it that none should be built nor any well dug upon a slope below a graveyard. Decomposition begins in the human body almost immediately after death, and continues for a longer or shorter period, according to the quality of the soil and other circumstances. "A porous soil," says Ford, "through which there is an active change of air and water, hastens the return of the body to its natural elements. The pro-

ducts of decomposition are carbonic acid, carburetted and sulphuretted hydrogen, ammonia, nitrous and nitric acids, and various more complex gaseous compounds and offensive organic vapors, which are resolved into simpler combinations by the oxidizing power of the soil. The non-volatile substances remain in the ground, are taken up by the roots of plants, or are washed away by water passing through the pores of the soil. Soils differ very much in the manner in which they effect these destructive changes. There are grounds in which a corpse may be completely destroyed in three or four years, and others in which twenty-five or thirty years will be required for the effectual decomposition of the body. If there be a proper selection of the ground, with especial reference to the facility of constant change of air, and if its powers be not overtaxed, the powerful absorbent and oxidizing qualities of the soil, aided by the action of growing plants, may be depended on to dispose, in a harmless manner, of the gases and vapors evolved during decomposition. If, on the other hand, these precautions are not observed ; if a soil be chosen in which there is stagnation of air and water ; if the bodies are buried in close contact and with an insufficient covering of earth,—the offensive gases and putrid vapors evolved in the process of decomposition will accumulate and assume dangerous proportions. The ground becomes

saturated with these foul products to such a degree as to be incapable of further absorbing them, and the air and water of the locality are poisoned by the noxious matters emitted from the surcharged soil. Such burial-grounds are an evil, no matter where located; but when situated in close proximity to dwellings, they are undoubtedly most detrimental to health."

Contamination from dead bodies usually occurs through the agency of wells and other sources of supply for drinking-water, which collect the drainage of cemeteries. The utmost care must be taken therefore that wells, ponds, and reservoirs are far removed from such localities. No dwelling should ever be allowed in the valley below a graveyard, unless a watercourse of some size intervenes, and not even then unless the stream has a rapid current and a gravelly bed.

It is best not to live near a factory, mine, or hospital, since injurious gases, vapors, and dust particles may be developed there. **Swamps and Marshes**, too, are bad neighbors, for the humid air is often vitiated by the emanations of decomposing animal and vegetable matter. These are very unhealthy, often causing marsh fever, malaria, and other ailments. In tropical and sub-tropical regions, where cold northern winds are unfelt, such swamps may be rendered harmless by planting eucalyptus trees in

their vicinity; and sun-flowers, in the temperate zone, may be made to serve a similar purpose in some degree, especially when planted in large numbers.

In the general plan of their arrangement **American Dwelling-houses** are usually modeled upon the English pattern, being intended for the use of only a single family. The great advantages of this plan, so far as privacy is concerned, are not to be denied; but, in respect to health, one important objection exists in the large amount of stair-climbing entailed upon a diligent housewife and upon her servants. Ladies whose hearts or chests are weak have learned this in some instances to their cost. Cases in which the degenerative changes taking place in the lungs, or more frequently in the heart, have been hastened to a fatal termination are well authenticated. For such individuals the Continental arrangement is far the best. In most countries of Europe the houses are much larger than here, and each story is arranged as a complete suite of rooms for one family. The front door of the building is constantly open during the daytime, and leads, by means of a broad passage-way, into a courtyard, generally of good size. Such an adjustment insures good ventilation, with a plentiful supply of fresh air. The "French flats," so called, in our large cities, are similarly arranged, but one marked difference exists, of which farther on.

The Carpets of a house claim a special mention from us. The plan of carpeting floors to which we are accustomed is a decidedly unhealthy one. When the carpets are nailed to the floor in such a way that every portion is covered, the dust which settles upon them can be only partially removed by sweeping, and accumulates in increasing quantity upon the planking below as well as in the meshes of the carpet itself. This dust, continually raised by every foot-step, inevitably renders the air unhealthy; and the evil is increased by the layers of thick paper and cotton wadding usually interposed between the floor and the carpet by way of lining.

The method which prevails in Europe, and which is now largely imitated by well-to-do people here, is quite different. In accordance with this plan the floor should be inlaid, or at any rate laid in hard woods, and should be frequently polished with wax. One large carpet is used to cover the greater part of the room, or perhaps rugs are spread in different places, beneath tables, and before sofas, pianos, book-cases, and other articles of furniture, much as we are accustomed to lay them upon our carpets. This insures much greater cleanliness and a remarkable absence of dust, for even the largest rug can be readily taken up and shaken as often as necessary, without waiting for the annual housecleaning, of which our dames stand in such dread. It is a fact

well known that at this periodical season of renovation danger always exists of infection by some disease whose germs are lurking in the carpets or in the crevices of the floor. Perhaps the best form of floor-covering under all circumstances is linoleum, since germs and dirt find it difficult of invasion, and since it can easily be cleaned with thoroughness.

Windows, too, are better constructed abroad. Our frames, balanced by weights upon cords, render it impossible to utilize more than one-half of the entire opening for ventilation at a given time. In Europe, however, the frames hang upon hinges and close together in the middle, like glass doors leading to a balcony, so as to leave the entire space available for ventilation when required.

The evils attendant upon the presence of gas pipes and fixtures it would be difficult to escape unless by replacing the gas by the use of **Electric Light**. This would be an advantage from another than a hygienic point of view, for statistics taken in factories prove that electric light is far better for the eye than gaslight.

Far more objectionable than our private houses, or the large continental dwellings let in separate floors, are the **Tenement Houses** and the large majority of so-called French flats in our large cities. Real French flats have at least one court yard, surrounded by the four wings of the building, and fur-

nishing abundance of light and air. Such an arrangement is only partly carried out in the large flat and apartment houses which have lately come into vogue among us. These resemble for the most part the continental style of houses. But, in common with tenement houses, they have in reality only one light room, sometimes two, one facing the street and the other looking toward the rear of the building. The remaining rooms, from two to four in number have no direct source of light and air, but are, for the most part, dark and close, being lighted and ventilated only through other rooms. It is only lately that air-shafts begin to be built in such buildings, but even the modicum of air and light obtained in this way is dearly paid for in loss of comfort. Privacy is no longer assured, since nearly every word spoken can be distinctly heard through the air-shaft upon the floors above and below. Moreover, free access is afforded from each story to every other for the odors of the kitchen and the chamber, as well as for the germs of disease. And last, but not least, among their evils stands the danger during fire which these shafts constantly threaten.

In tenement and apartment houses the bedrooms are of necessity the dark and close rooms situated between the two light ones. Although many of these communicate by small square windows with the stair-case or air-shaft, which is almost always

dark, this is the poorest kind of makeshift, since the air procured from this source is often the worst imaginable. The good old rule, that the kitchen must be as far as possible removed from the living-rooms, and especially from the sleeping-rooms, can in these houses never be complied with.

## CLIMATE.

The climate we live in is of very great importance as regards our well-being. Cold increases the rapidity of the combustion-process going on in our bodies. To meet this increased tissue-change we must dress warmly and must eat heartily. The climate of the tropics on the contrary slows this process of combustion, and there, accordingly, we require less oxygen, and must dress, therefore, very lightly, at least in the day time, and reduce the amount and richness of our food.

It is best to visit tropical countries only during winter, and to resort, if possible, to regions which are high and dry, particularly to those which are exposed to cool, refreshing winds. Too great care cannot be taken in tropical regions. Plain, easily

digestible food, preferably vegetables, should be moderately partaken of. The stomach must never be allowed to become empty nor to be overloaded, and alcoholic liquors of every description are to be avoided. Loose garments of wool should be worn, or, if unobtainable, of cotton, and some form of light head-covering, which will give ample protection from the sun's rays. At night a flannel belt should be worn, for it must always be remembered that the nights are apt to be cool, however intense the heat of the day, and one should take great care not to expose one's self to cold, dew, and cool winds. No one should sleep in the open air, and excitement of every kind should be avoided.

A constant watch should be observed by residents in this enervating climate against that impairment of vital energy which is so apt to attack those born in the north, and which is not wholly unknown to the native population. The first sign of this condition should be taken as a warning to repair to a cooler and healthier locality. The climate of the temperate zone is healthiest. The change of seasons, the variable temperatures and winds, are natural stimulants, which influence health favorably and render life more enjoyable. Sudden and marked changes, however, such as so frequently occur in this country, cannot be otherwise than pre-

judicial to health. The difference in this respect between Europe and America is due to a certain extent to the different direction of the large mountain chains. While upon this continent the Rocky and the Alleghany chains of mountains extend from north to south, in Europe the Alps, the Carpathian mountains, the Balkans, and other chains run from east to west. By this circumstance the prevailing direction of the winds is materially influenced, and so, in this country, cold northerly and hot southerly winds alternate. Exceptions to this rule may be found upon some of the slopes of the Blue Hills, as well as in certain regions of Colorado, New Mexico, Utah, Southern Montana, Idaho, and Oregon, which are protected from northerly winds, and which are the healthiest portions of America, perhaps of the world.

The sanitary offices of large forest tracts are manifold. They protect from wind, dust, and disease, suppressing the germs of the latter, equalize temperature in summer as well as in winter, and attract rain and other forms of humidity. The increasing destruction of forest lands causes a corresponding increase in unfavorable climatic changes. It is an opinion extensively held by seafaring people and others that the constantly diminishing area of forest land in our country is justly to be considered

one of the causes of the increase in frequency and violence of such meteoric disturbances as tornadoes, cyclones, gales, and hurricanes. The opposite conditions are seen in the Argentine Republic, where pampeiros, wind-storms of terrific violence, have greatly decreased in number and intensity since forests have grown up extensively.



## PART SECOND.

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### THE CARE OF THE SICK.

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THE complete understanding of a given complaint is not made possible simply by a knowledge of the patient's sensations, nor by that of his apparent functional disturbances. The exact determination of physical conditions and qualities is no less indispensable. This determination of symptoms, which to the physician are of the utmost value because they evidence changes which can be seen, heard, felt, numbered, measured, or weighed, is possible moreover only by the aid of physical diagnosis, and only to the able physician, skilled in such methods of investigation as inspection, palpation, percussion, auscultation, and chemical and microscopical examination. It is only by the aid of physical diagnosis and other scientific methods of inquiry that certainty can be attained in regard to a disease which evidently exists, and a physician who fails to employ these methods of investigation is to be considered undeserving of confidence. Especially is it true that physical diagnosis

is absolutely indispensable, inasmuch as entirely distinct diseases frequently present subjectively and functionally just the same symptoms, although very different ones physically ; while, on the other hand, one and the same disease may in different instances occasion altogether different sensations and functional disturbances.

## NURSING.

Before giving special instructions for the management of any individual ailment, we wish to call attention to certain general rules which are to be regarded in every instance.

A diseased organ demands the greatest indulgence. An unsound leg must not be used in walking, running, or jumping ; a disturbed stomach must not be tried by indigestible food ; hoarseness interdicts talking, singing, and shouting ; weak eyes should avoid a bright light ; a short-winded person must not hurry in going up or down a staircase, or on the slope of a hill. It is against this cardinal rule that the larger number of offences is committed, especially during the convalescence of a diseased member. Most patients find it hard to await quietly

the complete healing and restoration of an impaired organ, but would hasten to burden a part, still weak and but imperfectly recovered, with tasks beyond its capacity. The unwelcome result is that the disease breaks out afresh and assumes now a graver character and a more lingering type. Especially in typhoid fever do we often see a fatal recurrence, and no physician should omit to caution a patient convalescing from this disease against the very dangerous consequences of departing from the prescribed diet.

The patient should observe a well-balanced, restful self-restraint, avoiding everything at all out of the ordinary. It is surprising how many persons in sickness feel constrained to do something strangely inconsistent with their condition. This may be thought the reason, in no small number of instances, why at a certain point an illness is disturbed in its otherwise favorable course and begins an advance toward a fatal termination. It would be much better for every patient to remain in his room, if not in bed, up to the end of the period of illness, quite as carefully as at its beginning.

Everything furnished the patient should be of the best quality. Above all, at night as well as during the day, the air of the sick-room should be pure and free from drafts and from dampness. The mattress must not be too high, the temperature of the room

must preserve an equable medium, and the food must be easily digested and moderately nutritive, while the drinks should be mild and unirritating. All unusual excitements are to be avoided, as well as efforts of the mind, senses, or body, glaring lights, loud noises, and disagreeable odors.

Very often we find it to be the case, and not a little, it may be, to the injury of the patient, that he is either greatly overfed, or that nearly all nourishment is withheld from him. Generally the rule is to give little food at a time and to repeat it frequently. Food prepared for the sick should always be of the best quality and cooked with the utmost care. The nurse should bear in mind that her task is that of supplementing an impaired digestion. Food should be served at regular intervals, and speedily removed if not promptly eaten.

Under no circumstances may the sick-room be allowed to go unaired, the patient's linen to remain long without changing, or his body to stand in need of bathing. In nearly every complaint the functions of the skin are subject to more or less disturbance, and in many grave diseases it is through this channel almost exclusively that nature finds means of relief. The poisonous excretions are merely thrown out by the skin, not carried away from its surface. Nothing but soap and water can effect that. If we permit a sick person to remain unwashed, or his

clothing to be worn after it has become saturated with perspiration, we interfere just as much with the natural processes of tissue change as if a slow poison were given by the mouth: the only difference lies in the less rapid action of the former.

Special care should be observed in the use of water for Bathing in the case of persons suffering from debility, the result of sickness or of age. In such persons it is often seen that a bath, such as was used with benefit in robust health or in younger years, is followed now by palpitation of the heart, slackened pulse, more or less vertigo, shivering, and other feelings of discomfort, lasting for some time after its use. In ordinary cases it may be accepted as a good rule that whenever a bath, hot, tepid, or cold, is followed by a sense of oppression or by inconvenience of any kind, it has done, not good, but harm.

Baths, more especially tepid and cool ones, are often employed by physicians in the reduction of temperature. In long-continued illnesses the physician and nurse must pay particular attention, during the patient's bath and the change of his bed-linen, to the condition of his back and hips, in order to ascertain if bedsores exist, and, should they discover the reddish discoloration which marks the appearance of these distressing ulcers, appropriate treatment

must at once be instituted. The time consumed by a patient's bath should not be unduly prolonged, and the same is to be said in regard to thin-skinned individuals when in health. As soon as a chilly feeling arises the bath should come to an end.

When a bath is objectionable, the best substitute is found in chafing, wrapping in wet towels, or in sponging followed by thorough drying. In severely painful affections of the chest or abdomen the earliest relief may often be obtained by means of a Priesnitz Dressing. For this purpose a sheet is folded neatly and evenly to the width of the body, and one end of it is dipped in water and wrung out until it ceases dripping ; then the wet half is applied to the chest or abdomen and the whole sheet is wound as tightly as possible about the body, so that the dry portion overlies the wet portion. By this means an agreeable warmth is established for three or four hours.

Of still greater importance than the cleansing of the skin is that of the mucous membranes as a measure of precaution against the adhesion of disease germs as well as against digestive disturbances. If the patient is unable to cleanse his own nose, mouth, and pharynx, some one else should do this for him, by wiping off the membrane of these regions as carefully as possible with a sponge or pledget

dipped in the disinfectant solution the doctor has ordered. The cloths or sponges used for this purpose should be immediately burned.

**Spittoons and Chamber-vessels** require thorough cleansing. As soon as possible after use the contents of these vessels should be disinfected and emptied. Under no circumstances ought they to be allowed to stand uncovered. The cover of a chamber-vessel is always coated when in use with a pungent, badly-smelling moisture, which the absence of a cover would have allowed to permeate the atmosphere of the room. When emptied, the vessel should be cleansed along with its cover, filled with water or with a carbolic solution, and set aside for a considerable time to air. Meanwhile another vessel should be employed. The vessels preferable for use in the sick-room are those of earthenware, porcelain, or well-varnished wood. Wooden earth-closets are objectionable, since they cannot be thoroughly disinfected and are therefore liable to disseminate disease. The waste bucket must never be brought into the sick-room, but all vessels emptied and cleansed in the water-closet instead.

Every appurtenance of the sick-chamber, and especially the patient's **Bed**, unless some reason exist to the contrary, must be subjected once or more each day to a thorough cleaning, and later on to frequent disinfection. If possible, the patient

should be transferred for about an hour during this process to another room already cleaned and aired. Meanwhile all the windows of the sick-room are to be opened as widely as possible in order to effect an energetic ventilation. The bed must then be taken completely apart and the mattresses, pillows, and bed-clothing either renewed or turned, or at any rate thoroughly and individually aired.

None but light blankets should be used as a covering for the sick. Weak patients are invariably distressed by the weight of bed-clothing, which often prevents sound sleep. The bed should not stand too high to allow of the patient's leaving it and moving about, when the physician permits. It should not be placed in a corner, but should stand as nearly as possible in the middle of a large room, so that the patient shall receive air and softer light directly from their sources. Bed-curtains are accordingly inadmissible.

If possible, the sick-chamber should be that room in the house into which the **Sunshine** has the readiest entrance; and if the bed can be so placed that its occupant sees a stretch of blue sky, so much the better will it be. If the patient can see out of two windows instead of one, he will be twice as well off. It is found in all hospitals that rooms which admit the sunlight have fewer deaths, all other things considered, than those upon the shady side of the build-

ing; and, where statistics have been kept for a period of years, it is found that the average time for recovery is earlier upon the sunny side than upon the shady. Furthermore, it has been shown that in asylums, prisons, and other institutions more of the inmates become ill who are compelled to reside upon the shady side of the building than of those who live on the sunny side. The intelligent reader will remember the sad variety of idiocy, called "cretinism," which is found so commonly upon the sides of deep valleys in Switzerland, where the sun has no freedom of access; a form of mental disease wholly unknown upon the opposite sides of such valleys, more favored by the sunlight. These statements plainly demonstrate the value of sunshine, and he must indeed be very unwise, who neglects to apply his knowledge of its importance to the affairs of everyday life. There are a few diseases, such as certain affections of the eye or brain, in which a subdued light is required for a time. But even in these a room on the sunny side of the house, with suitable curtains at the windows, is usually to be preferred to one upon the shady side.

A sick person should never under any circumstances be awakened from sleep without the sanction of the physician. Once awakened after a short nap, a patient can rarely fall asleep again; while, had he slept a few hours before being aroused, he might have

fallen asleep again in a few minutes with little effort.

As a rule **Visitors** should be excluded, and only those admitted who are congenial to the patient and whose pleasant and friendly faces seem therefore to exercise a beneficial influence over him. In like manner he should be surrounded only by agreeable objects, such, for instance, as his favorite flowers. For protection from the annoyance of flies and **Mosquitoes** screens should be used in spite of their slight interference with ventilation. If other measures are found necessary against mosquitoes, an effective preparation may be supplied in the balsamic "essence of pennyroyal," a vial of which is to be left hanging uncorked above the bed. The pain and redness of the skin which result from the bite of a mosquito disappear at once upon the application of spirits of ammonia, or, still better, of the anisated spirits of ammonia.

**Noises**, and especially startling noises, ought most carefully to be guarded against. A good nurse will see that no door opens with a creak, that no window rattles, and a very good one will also make sure that not even a curtain flaps. A drop of oil and a feather may be relied on to do away with the creaking.

A sick person never should be subjected to curiosity, anxiety, care, sorrow, or any form of fear. As a rule business matters should not be discussed in the

presence of the sick. Sometimes a man who has made no will before his illness is anxious and uneasy until that duty is accomplished, but takes a favorable turn as soon as the matter is off his mind. The less mental effort demanded, the better for the patient.

It is the **Duty of a Nurse**, both in his own interest and in that of his charge, to avoid every form of activity prejudicial to his health, every diminution of his strength, and every possibility of contagion. For the latter reason he should be careful never to approach the bed of a patient sick with contagious disease, when his own stomach is empty ; for such a stomach predisposes greatly to contagion. He should wear no beard, should keep his hair cut short, should bathe and disinfect his person frequently, and should often change his linen and outer clothing. The latter should be light rather than dark in color. The nurse should not approach the sick-bed upon the side removed from an open window, in order that the entering air may not have an opportunity of reaching him across the bed. He should never raise a bed-covering from his own side of the bed, but always from the opposite side, reaching across the patient, in order not to expose himself to the first outburst of contaminated air confined beneath the fabric. In cases of contagious disease neither the nurse nor any other person ought to be allowed to make use of any article used by the patient. In certain conta-

gious diseases, moreover, every one who approaches the patient should wear a respirator before his mouth and nose, for this precaution insures protection by compelling the air inhaled to pass through a layer of cottonwool, which absorbs all germs of disease. But a person so protected, while himself escaping infection, is quite capable of spreading the disease by means of his clothing, and he should not fail to disinfect himself thoroughly as soon as he leaves the patient. This warning refers especially to persons leaving crowded institutions where contagious diseases are rife, such as schools, camps, prisons, ships, and hospitals.

A judicious physician will limit the amount of **Medication** to the smallest possible quantity. On the other hand it is the part of wisdom for the patient to follow carefully the doctor's instructions and to avoid any offence against his commands. Many drugs are poisons, and the patient may under no circumstances increase the dose his physician has ordered, in the belief that a larger quantity of the drug will bring him quicker relief. Not only do such capricious acts sometimes prove dangerous and even fatal to the patient, but they have in other instances precisely the opposite effect from that intended for the drug, for many substances act in quite a different way when taken in overdoses from

what they do when administered according to directions.

A disposition is often seen to purchase medicines wherever they can be obtained at the lowest price. This course, however, is always an unwise one, as the education of the purchaser does not permit him to judge of the purity, strength, or efficiency of the drug. Medicines should invariably be bought of the most reliable druggist. What is left unused of prescriptions ordered by a physician should not be preserved, as there is not one chance in a hundred that the same special combination will ever be required again, unless in the case of some liniment or some constituent of one which can be utilized in some way. Beside this, medicines as a rule do not keep well, and the more bottles of this sort to be found about the house, the greater is the likelihood of a mistake in getting hold of one when another is wanted. When not in immediate use all medicines should be kept in a separate closet or in some other well-determined repository. Such place of storage should be wholly free from dampness, for moisture impairs and gradually destroys the efficacy of most drugs, especially when in the form of powders. If the closet can be kept under lock and key, so much the better. Light must be excluded, as it destroys many substances. A low, uniform temperature is likewise desirable.

Pills kept for some time become so hard that they are not more soluble in the stomach than grains of coffee. This is especially true of sugar-coated pills, but the objection may be overcome by enclosing the number to be taken at a dose in a piece of muslin and reducing them to fragments by a blow.

The most dangerous persons about a patient are the old (and in not a few instances, too, the young) aunts and grandmothers of either sex, who are often the more importunate with their panaceas, the less they understand about the matter. Such individuals would do better, instead of vaunting the infallibility of their preparations in every known ailment, to examine into their own conduct, and to confess, in the light of their age and past experiences, that they are assuming an unwarrantable responsibility by interfering with and often by completely neutralizing the physician's treatment. Nowhere has the saying, "Deliver me from my friends," a truer application than here. Often, indeed, there is less of friendship and sympathy than of self-love and vanity in the motives which prompt this usurpation of the healing office. While a physician takes pains, in the statement of his diagnosis and prognosis, to be tender, sparing, and considerate, these obtrusive meddlers, in order to stand afterward in so much the better light, vie in setting forth the patient's condition in

gloomy, unconsoling colors, thereby greatly depressing his mental and bodily powers of resistance. Still, the more reprehensible their conduct, the less risk is there for them : if the patient recovers, they take the credit ; if his sickness assumes a serious turn, it is the doctor's fault.

On the other hand, much depends upon the influence of sympathetic clergymen and truly considerate friends, who have it in their power to set quite at ease the devout and trustful spirit of an invalid. This indirect assistance is of great value, for no physician, to whatever quarter his religious belief may incline, will deny that a patient's recovery may be materially hastened by favorable mental influences.

Clergymen and school teachers in country districts where no physician is at hand would do well to possess themselves, like captains of vessels, of a certain amount of medical knowledge, in order to be able in emergencies to render the earliest and most necessary aid without waiting for the doctor's arrival. With the same object a small stock of medicines should also be kept at hand, whose composition and uses have been explained by a neighboring practitioner.

## THE FAMILY PHYSICIAN.

The head of a family displays his intelligence as well as his paternal love and solicitude by a proper appreciation and a timely and judicious employment of a skillful physician. When in doubt as to the need of a physician, it is safest to call one, and so to quiet both conscience and anxiety. The physician should not be changed, but choice should be made at the outset of a skillful, reliable practitioner, whom henceforth the family should employ upon all occasions, in whom the fullest confidence should be reposed, from whom nothing should be concealed, and who should be entrusted with all the secrets of the household ; for the doctor, like a good general, must possess an accurate knowledge of the whole field. It is a good plan to agree with the family physician concerning a definite yearly compensation not too scanty in amount, for such an arrangement offers security that he will exercise strict vigilance in preventive sanitation, and that he will promptly allay the first symptoms of a disease, or at least moderate its course so far as possible.

The eye of a physician excels even a mother's in acuteness, and frequently discovers threatening evils which have escaped the latter. Not infrequently it

happens that a disease has taken root without so much as a misgiving upon the part of the individual affected. This shows the advisability, even for those who consider themselves well, of submitting, once or twice each year, to examination by a conscientious physician. Still farther, the preventive skill of the physician should be invoked in regard to the building of a house or the hiring of one, the hygienic arrangements of the dwelling, the apparatus for heating and lighting, ventilation, diet, the selection of a wet-nurse, the climate of a location, the education of children, the selection of a calling, the question of matrimony.

On the other hand it is the perpetual duty of the physician, in whose hands lies so largely the fate of families and of communities, to study exhaustively, and to keep himself well informed throughout his whole life in all matters of scientific medical practice. The life of a conscientious physician, whether he have much or little practice, is an almost ceaseless alternation between hours of attendance upon patients and hours of study. It is not to be wondered at, in view of their enormous bodily and mental exertions, as well as their sacrifices, that physicians do not belong to the long-lived classes, even if we omit to consider their exposure to contagious diseases. The physician, therefore, is entitled to claim, not

merely a liberal compensation, but also the fullest gratitude and veneration. Whoever makes easier to physicians and to medical students either the pecuniary or the mental struggle of life, whoever "strews roses on their paths," deserves, not only from them, but from all mankind, to whom the doctor is called to minister, the sincerest thanks. Especially should philanthropists appreciate this well-meant appeal, and contribute freely to the establishment and maintenance of medical institutions of various classes.

## HOW TO GIVE AID IN EMERGENCIES.

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In considering the treatment of the sick we design to lay stress especially upon measures of relief in cases of accident and sudden illness, when life is often jeopardized by a failure to render immediate aid. Our object will be to place the intelligent layman in such a position as will enable him in cases of emergency to render the earliest efficient assistance. This we would do without in the remotest degree depreciating the services of the physician, for, even if the patient has been relieved before the doctor arrives, still, further treatment is always found indispensable. In other diseases, however, where there is no danger in a moderate delay, we restrict ourselves to a short hygienic and dietetic summary, leaving the main points of treatment to the attending physician.

The occurrence of an accident in any well-populated region is sure to draw a crowd about the victim. The first thing to be done is to disperse such a gathering, or at least to persuade spectators to keep away from the injured person. A space of

not less than ten feet on every side should be completely cleared, only those being allowed to approach nearer who are in immediate charge of the operations for relief. In most cities appliances for carrying injured persons are required to be kept at police stations, and can be obtained on application, as well as the services of a good policeman. The authority of the latter is almost invaluable in keeping back the crowd and in securing useful attention while conveying the injured individual through the streets.

**Fainting.** When anyone faints he should be placed in a recumbent position, with his head low, if he is pale and bloodless, but high, if red in the face, and every tight-fitting garment should be loosened. Then he should be fanned in the open air or by an open window, cold water should be sprinkled over him, and his temples bathed with vinegar, ether, or cologne, while ammonia, burnt feathers, or singed hair are held beneath his nose, and his nostrils are tickled to make him sneeze. If the faint be a deep one, an enema of vinegar may be administered, the feet and hands bathed in warm water, the soles of the feet chafed, and mustard applied over the heart. Upon coming out of the faint the patient should still preserve for a time the reclining or recumbent position, and should drink a little cold water, some brandy and water in the proportion of a teaspoonful of brandy in a tablespoonful of water,

or a little aromatic spirits of ammonia, ten drops every few minutes in a tablespoonful of water.

**A Trance** is the most extreme form of fainting, and the appearance of a person in a trance resembles very closely that of one dead. Only a layman, however, can make a mistake in this respect, certainly not a physician trained in scientific accuracy and in careful methods of examination ; for such an examination soon makes it apparent that both heart-sounds, or at least one of them, can be heard in a lethargic person, although sometimes very faint and infrequent. If heard less frequently than once in five minutes, the condition must be that of death. Another evidence of death may be found in the eyes, which present a dry and wrinkled appearance of the conjunctiva and cornea. The condition of the skin may be tested by rubbing it with a cloth dipped in caustic ammonia until the epidermis or outer layer has been removed : in a dead person the eroded spot will dry like parchment, while in a lethargic it will become moist and red. Accurate proof of death, if it exists, may be obtained by thrusting a fine aspirating needle into the heart muscle between the fifth and sixth ribs, an experiment attended by no danger when the needle is not inserted too deeply. The slightest motion of the heart will then be detected from the quivering imparted by it to the projecting portion of the needle. The surest test for a layman

is decomposition, which begins with a bad odor and with green spots upon the skin. Trials with electrical apparatus are unsatisfactory, unsafe, and ought never to be made.

The signs of revival from a trance are a slight increase of warmth about the heart, the blurring of a mirror held before the mouth, the trembling of a feather in the breath, sensitiveness and contraction of the pupils when approached by a light, reddening of the skin when chafed, slight movements of the muscles of the face and eyelids, a gradual strengthening of the pulse and heart-beat, together with a slight rising and sinking of the chest, best seen when a glass of water is set upon it. To avoid burial during life the most serviceable measures are the prohibition of premature interments, the allowing of interment only after the beginning of decomposition or after an autopsy, and the careful determination of death by medically competent persons.

The treatment of an individual apparently dead should be begun by freeing him from every injurious influence, such as ribbons about the neck, noxious gases, and, in the case of those nearly drowned, from water in the air-passages. This accomplished, he should be placed in a room filled with fresh air, his clothing removed cautiously but as quickly as possible, by cutting it off, if necessary, his mouth and nose cleared of any obstruction, and an effort

made to restore his nervous energy, his circulation, and above all his respiration. This may be accomplished by making warm applications to the body and by warm baths, by washing the skin with vinegar, by rubbing, brushing and kneading it vigorously, by tickling the nose and throat, by rousing the nerve of smell with irritants such as spirits of ammonia, by dropping naphtha and spirits of mustard upon the præcordia, or by applying a mustard poultice in the same region. Especial benefit may be derived from artificial respiration and from blowing air into the lungs. If, in effecting the latter, the operator would avoid applying his mouth to that of the patient, let him apply a funnel, bladder, or other tube. During the inspiration the nose of the patient must be kept closed. After the lungs have been filled with air, the chest and abdomen are to be pressed upon and the air expelled, or the patient may be rolled upon his back and chest alternately. It is often sufficient to compress the abdomen between the palms of the hands, in order to press upward the diaphragm and lungs and so to expel the air forcibly. Then, when the hands are withdrawn, the diaphragm returns to its former position, and air is drawn into the lungs again. In persons in this condition artificial respiration should be maintained for at least four or five hours, the face, chest, and back being sprinkled meanwhile at intervals with cold water.

Upon the revival of the patient the efforts for his restoration should be remitted at times, but they should be continued gently with intermissions until his complete return to consciousness. Wine should be administered, if possible, at this stage as a restorative. If sleep occurs or perspiration breaks out, care should be taken not to interfere with them.

When every effort at resuscitation proves ineffectual, the unfortunate should be wiped quite dry, and covered with a cloth, his head being allowed, however, to remain uncovered. He should be placed in a warm room, where he should be kept under observation until the signs of death appear. This latter precaution is necessary, because sometimes it happens that a person does not come out of his lethargy until the efforts for his recovery have been suspended and he finds himself alone and in quiet.

The most practical method of reviving **Persons Nearly Drowned** is that of **Marshall Hall**. The submerged man must be removed from the water gently, any roughness in shaking, rolling, or tossing the head about being especially avoided. The nose, mouth, and pharynx should at once be cleansed carefully from mud, sand, and water. It is also a good plan to tickle the throat with a feather in order to induce vomiting, thus emptying the stomach and lungs of foreign material. The unfortunate individual should then be laid without delay upon his

chest with one arm beneath his forehead. Both hands of the operator are then to be pressed lightly upon his back, so as to eject the water from his larynx and a part of the air from his lungs. His body is then to be repeatedly rolled over slowly upon the shoulder whose arm lies beneath his forehead, or even a little farther over, and at once quickly returned upon the face. By means of this procedure the process of respiration is again instituted. Gradually the heart begins to beat more strongly and more frequently; blood rich in oxygen flows to the brain and spinal cord, and through the revival of these organs the whole body returns to its former condition.

This restoration should be effected very quietly, without precipitation and without rude violence. The patient should not be made to breathe oftener than sixteen times in a minute, which is the frequency of normal respiration. If possible, his limbs should be briskly rubbed, for this excitation has a restorative action upon the skin. Wet clothing should early be replaced by dry. The duration of artificial respiration is to be regulated by the necessity of the case. When the individual has been less than five minutes under water, artificial may be immediately followed by natural respiration : in other instances life is restored only after thirty or forty minutes of continuous artificial respiration.

Even when submerged persons have been as long as twenty minutes in the water, success has sometimes been attained in restoring them to life. This method is adapted not only to the revival of persons apparently drowned, but also to that of persons in a state of suspended animation after hanging, after the inhalation of carbonic acid, illuminating gas, or chloroform, and under other circumstances.

Still more effective, it appears, is artificial respiration according to the **Method of Dr. Sylvester**. By this method the patient is to be laid upon his back upon a gentle incline, in such a way that his head shall lie a little higher than his feet, and a small, firm cushion is to be placed beneath his head and shoulders, or, in its absence, a folded garment. Next, his tongue should be drawn forward and secured beyond his lips. For this purpose the most serviceable appliance is an elastic band fastened over the tongue and under the chin. The operator, standing behind the patient's head, should then grasp the arms of the latter just above the elbows and draw them, with a gentle, steady motion, to a position of extension above the head. Here they are to be held for about two seconds, while air is allowed to enter the lungs freely. The arms are then to be carried downward and pressed gently but firmly for about the same length of time against the sides of the patient's chest, in order to expel the air from his lungs. These mo-

tions should be repeated in alternation ten times in the course of every minute until a continuous respiratory movement becomes perceptible. When this happens artificial respiration may be discontinued and an effort made to restore the warmth and circulation of the body.

A special apparatus for artificial respiration may sometimes be found of service. It establishes artificial respiration by introducing condensed air into the lungs and withdrawing it again by means of bellows.

In speaking of the restoration of submerged persons we would advert to the remark so often made of such individuals, "he was a good swimmer, and must have been attacked with cramps." The reference is to a spasmotic contraction of the muscles, beyond the control of the individual, which occurs after exhaustion of a muscle from over-exertion. Persons suffering from debility, especially the debility peculiarly affecting the nervous system, should never be induced to go beyond depth in the water or out of reach of immediate assistance. There is no warning in advance of the seizure, and the unfortunate individual sinks at once. Many lives are every summer lost, in shallow as well as in deep water, from these seizures, which might have been avoided, had the bather, who is perhaps just recovering from an attack of sickness, not neglected the above precau-

tions. A farther word of caution to those in danger of drowning, whom presence of mind may enable to preserve their lives. Throwing up the hands serves only to expel the air from the lungs, and so to lessen the period during which a stay under water can be endured. On the contrary, he who, upon finding himself overwhelmed, places his arms beside his body and quietly husbands his stock of air, is far more likely to be resuscitated by the rescuers.

Attention to the following rules will prove of service to the rescuer in cases of accident: (1.) Before jumping into the water, remove rapidly as much of your clothing as possible: if there is no time to do so, this preparation may be omitted, but in any event remove your shoes from your feet, for they will fill with water and so impede your swimming; (2.) do not seize hold of a drowning man so long as he struggles in the water, but wait a moment until he is quiet: it is foolhardy to take hold of a person who is fighting with the waves, and whoever does it subjects himself to great risks; (3.) when the unfortunate becomes quiet, approach him and, seizing him by the hair, turn him as quickly as possible upon his back and give him a gentle push to keep him up: then turn upon your own back, and in this manner swim to land, holding the inanimate person's hair with both hands, and his head, face upward of course, upon your abdomen; (4.) if the drowning man has

sunk to the bottom, the place where his body lies may be known in quiet water by the air-bubbles which occasionally rise to the surface; (5.) if you succeed in finding the body by diving, seize it with one hand by the hair, and use your other hand and your feet to swim to the surface; (6.) on the ocean it is very foolish to try to reach land when a current sets offshore: it is better to turn upon one's back, no matter whether alone or burdened with the body of another, and so to float until help arrives.

A drowned person dies of suffocation. He inspires water instead of air into his lungs, and so takes in a large amount of water. Death from suffocation does not take place at once, but only after a prolonged struggle with the waves. A drowned person presents the appearance of one who has died of suffocation—face purple and swollen, lips purple, eyes bloodshot; upon opening the mouth, a frothy fluid exudes; and the stomach, windpipe, and lungs are also full of water.

Sometimes, however, the appearances are very different. The face is pale and flabby, and little water is found in the mouth, or at least no froth. These are indications that death has not occurred from suffocation, but that a fit of fainting or a stroke of apoplexy has taken place. In this event it may be supposed that the movements of the lungs have ceased immediately, and that the glottis, the entrance

of the windpipe, has closed spasmodically, so that little or no water can enter. This appearance is favorable, for under these circumstances the prospect of restoring life is far better than under those first described.

**Persons Suffocated** by carbonic acid, carbonic oxide, illuminating gas, or sewer gas must be removed as quickly as possible to a room where the air is pure and where the windows and doors are kept open to secure a constant renewal of the atmosphere. All clothing must be removed as rapidly as possible, and the patient, completely denuded, placed in a half-recumbent position, and the measures already detailed employed to restore him to life. If, however, the respiratory movements have already ceased, long-continued artificial respiration can alone be expected to give success.

If a person suffering from **Carbonic Acid Poisoning** was prostrate at the time the gas was inhaled, he may be inferred to have drawn a larger quantity of it into his lungs than if standing. For, being heavier than the atmosphere, much more of the gas is to be found at the bottom of a well or cavern than five feet higher up. In illustration of this fact we may cite the so-called "dogs' grotto" near Naples, a cave containing carbonic acid gas, in which dogs die, but not men. No well, vat, old cellar, or cavern of any kind should ever be entered

without a lighted candle being first lowered to its farthest depth. If the flame is extinguished, or if it burns dimly, indicating in this way the presence of carbonic acid gas, no one should under any circumstances be permitted to enter unless the foul air has been removed. It is not so heavy, however, that a strong current of atmospheric air will not readily dislodge it, and it may be rapidly absorbed by means of freshly slaked lime.

When a person is overcome by carbonic acid gas, he is of course wholly unable to help himself, and must at once be removed by another. Sometimes a grapnel can be used with advantage, but often the better way is to rapidly lower some bold, clear-headed individual, with a rope securely fastened about his middle, who can seize the unfortunate victim and bring him quickly to the surface. No time should be lost in lowering and raising the rescuer, since his own safety as well as that of the asphyxiated person—depends largely upon his being able to do all that is necessary during the interval for which he can hold his breath. For, of course, should he inhale the gas also, his situation in this respect would be little better than that of the man he was attempting to succor. A large sack is sometimes thrown over the head and shoulders of the rescuer: this contains enough air to serve for several inhalations, while the texture of the material

prevents the admission of the gas to any hurtful degree.

The asphyxiated individual should be stripped of all clothing as soon as he reaches the free air, and, if he did not fall into water upon being overpowered by the gas, his head, neck, and shoulders should be freely dashed with cold water. A simple sprinkling is not sufficient. Some one should stand at a proper distance with a bowl of water in his hand, and should throw its contents with as much force as possible against the parts named. Others should follow in rapid succession for as much as thirty seconds. Then the dripping water should be wiped away with a towel. This procedure should be repeated from time to time as occasion requires. Sometimes, if a stream of running water is at hand, the denuded body might be dipped again and again, care being taken that the face remains above the surface. Artificial respiration should then be prosecuted with as little intermission as possible.

If the patient has fallen into water and has become chilled, the use of cold water in this manner is to be avoided, since in that case the evaporation of moisture from the skin is likely to absorb more heat than the exhausted system can supply. In this event the individual should be placed in a warm bed with hot applications, and artificial respiration should at once be established, as in the case of asphyxia from

drowning and hanging. While artificial respiration is being used a constant friction should be kept up upon the limbs.

**Illuminating Gas.** It often occurs, when the gas has been "turned down" upon retiring at night, that the flame in some way becomes extinguished, and that enough gas escapes to give trouble to the sleeper unless the room is well ventilated. Persons have also been known to blow the gas out, as they would a candle, and more or less complete suffocation has followed. In such cases the treatment required is identical with that of asphyxia from the inhalation of carbonic acid gas.

The foul air which exists in drains and privies usually contains a large proportion of **Sulphuretted Hydrogen**, which arises from the decomposition of the residual matters always found there. Great caution on this account should always be observed in opening or entering such places or any place in possible communication with them, especially when long closed. A small quantity of pure sulphuretted hydrogen, if inhaled, usually proves fatal, but in the cases referred to the gas usually exists diluted with common air. When affected by this gas, the breathing becomes difficult, the individual loses his strength, falls, becomes insensible and cold, his lips and face turn blue, and his mouth becomes covered with a secretion of bloody mucus. The sufferer should be

removed as quickly as possible beyond the influence of the foul air, and treatment pursued as directed for carbonic acid poisoning.

The possibility of disaster from the inhalation of sulphuretted hydrogen should always be borne in mind in opening long closed drains or privy vaults, and the danger lessened by dashing into the cavity a solution of a few pounds of chloride of lime in a pailful of water. In the absence of the chloride, or "bleaching salt," simple lime and water may be employed in the form of ordinary "whitewash." This gas readily combines with lime, freeing the air to that extent of the poisonous compound.

A person **Struck by Lightning** should quickly be removed from the scene of the accident, at once undressed and placed in a half-reclining position, and wrapped in warm blankets. After this is done the measures of revival above described are to be employed, and especially that of artificial respiration. Some stimulant should be administered, a teaspoonful of whiskey, for instance, occasionally, or twenty drops of the aromatic spirits of ammonia in a tablespoonful of water. Burns caused by lightning should receive the same attention as those from any other cause. Recoveries are on record after an hour of suppose death from lightning.

Lightning strikes where there are metals, or where water, dampness, or evaporation occurs,

Therefore it is best not to be found near any piece of metal during a storm, and not to take refuge in the water nor under a tree. Localities where there are many men should also be avoided.

**Sunstroke**, contrary to the usual impression, is not in all cases due to exposure of the head to the direct rays of the sun. Statistics shows that prostration from the effects of heat may occur under shelter, in the shade, at night, or even in persons who have not been exposed to the sun for days before. Intense heat need not be solar, but may be artificial. Since the human body can cool itself much more readily in a dry than in a moist atmosphere, it may be expected to resist the severities of a dry, overheated climate more easily than the oppressive closeness of a damp and muggy one. For this reason sunstroke is much more infrequent in the dry belt of the Texan prairies than in the lowlands of India or upon our own seacoast. For the same reason too it is especially prone to attack indoor workers in confined, moist factories, and notably those who labor in laundries and sugar-refineries.

Sunstroke appears to be decidedly favored by intemperance, by want of acclimatization, and by debility following fatigue in a heated atmosphere. Occupants of badly ventilated sleeping apartments appear to be oftener affected than those who sleep in purer air.

It is generally thought by non-professional persons that the symptoms of sunstroke come on without any warning whatever. In most cases, however, it is preceded by pain in the head, wandering of the thoughts or total inability to think at all, disturbed vision, irritability of temper, sense of pain or of weight at the pit of the stomach, or inability to breathe with the usual ease and satisfaction. These symptoms become more and more marked until insensibility is reached, preceded sometimes by delirium. The skin grows very hot, and usually very dry, but when not dry is covered with a profuse perspiration. The face becomes dusky, or, as the saying is, blue. Breathing grows rapid and short, or slow and sighing. The action of the heart, as felt by the hand placed over it, is weak and rapid and often as tremulous as the "fluttering of a bird." In many instances, from what is popularly termed the commencement of the attack until it ends in death, the patient does not move a limb, nor even an eyelid. The gradual failure of respiration interferes with the natural purification of the blood in the lungs, a fact speedily attested by the livid, purplish appearance of the surface. From this lividity we are led to conclude that death takes place by asphyxia. In most cases of sunstroke, accordingly, death comes on gradually by arrest of respiration, such arrest being without doubt

due to direct paralysis of the respiratory centres by the excess of heat.

While we know that certain conditions favor the disorder, that a high temperature is necessary to its production, and can advise certain measures of precaution and relief found useful by experience in such cases, but little can be said of the true nature of the malady. It would seem that the great heat of the body induces some change in the character of the blood. Owing to this peculiar condition of the blood, the regions of the brain which normally control the action of the chest and heart muscles lose their ability to superintend the movements of breathing and circulation properly, and death from asphyxia follows. In some cases it may be that the sole cause is cerebral meningitis.

A person suffering from the phenomena of sun-stroke should at once be carried to a cool, airy spot in the shade of some wall, or perhaps to a large room with a bare floor, or, as is sometimes better, if no sunlight interferes, upon the pavement of a back yard. Unnecessary bystanders must be kept at a distance, for, in this as in every other accident, the patient needs all the pure air to be had. His clothing should be at once gently removed, and he should be placed upon his back with his head raised a couple of inches by a folded garment. His entire body, and particularly his head and chest, should

then be profusely dashed with cold water. In preparation for this step, a messenger should be despatched for a good supply of ice, and several buckets of ice-water should be made ready for use as rapidly as possible. The ice-water must not be sprinkled over the patient, but dashed against him in large bowlfuls. While one person prepares the ice-water, and another uses it, a third and even a fourth may employ themselves in rubbing the surface of the patient briskly, each with a handful of cracked ice enclosed in a towel. The purpose of these measures is to reduce the temperature of the body to something like a natural standard. When the decline in heat is noticed, the cold applications should cease and the patient should be carefully removed to a dry spot, where the entire surface of his body should be dried with towels. If any tendency toward a return of the high temperature should manifest itself, as is sometimes the case, even after the restoration of consciousness, it must be met at once by a renewal of the cold applications. A second rise in temperature need not excite surprise when we reflect upon the amount of superheated blood within the body not yet exposed to the influence of the cold applications.

Another method of treatment consists in wrapping the patient in a dry sheet and lifting him into a tub of water whose temperature lies between 80°

and 85°, this temperature being then rapidly lowered by means of ice. The time of the immersion should be between fifty and sixty minutes. In many cases the best resort will be the neighboring pump.

In cities a sunstroke patient, when reached, may be immediately stripped beneath the cover of the ambulance, and remedial measures applied during his passage to the hospital. Many lives are now sacrificed by the loss of critical moments in the interval between the finding of the patient and his arrival in the hospital ward.

Artificial respiration must be resorted to as soon as the heated condition of the body is overcome, and continued until natural respiration returns. The dashing of cold water over the chest and face is a useful means of encouraging a return of the suspended function of breathing, but the mechanical methods are best relied on in the main for this purpose.

Of drugs to be used in this condition the following are very warmly recommended. Antipyrin rapidly reduces the temperature, but must be used with great caution on account of its depressing influence upon the heart. Quinine is very cooling in cases where persons are compelled to work for a long time in a high temperature, as, for instance, cooks and firemen upon steamers in the tropics. Chloro-

form will often relieve the respiratory and brain difficulties very promptly : a few drops may be sprinkled upon a handkerchief, and held, for not longer than five seconds, within an inch or two of the patient's mouth, the application being repeated every minute. The best stimulant in all such cases is the aromatic spirits of ammonia, ten or fifteen drops of which may be given in a tablespoonful of water every few minutes for several doses.

During the heated term, as it is often called, all use whatever of fermented or distilled drinks should be abstained from. Not only do these favor in a general way a condition of the system in many respects similar to that which precedes sunstroke, but they deaden sensibility at the very time when it ought to be most on the alert, so that the individual is less able to detect slight changes in his feelings which might otherwise have served him as useful warnings. The use of such substances under the circumstances seems as irrational as it would be in time of great danger to prepare for watchfulness by taking a dose of laudanum.

Everything in any way calculated to impair the strength should be avoided. Sleep is a most wonderful restorer of strength, and the want of it is often caused by a late evening meal of badly assorted articles. Defective ventilation leads to a subjective condition favorable to the development of the malady

under consideration. Every evening in hot weather a bath should be taken, or at least the body should be sponged off with water before lying down. Drinking large quantities of cold water is to be refrained from immediately before, during, and after meals. For, the debility resulting from the heat weakens the digestive powers, and water unnecessarily partaken in excess at such times tends still farther to retard the digestion of the food by weakening the solvent action of the gastric secretions. Loosely-fitting, light-colored garments are to be worn, if possible, particular attention in this respect being paid to the head, which should be protected from the heat of the sun, while at the same time the covering worn must not impede the free circulation of a current of air about the scalp. A straw hat is to be preferred, of loose texture and with a lining in the crown, and its wearer will be just so much better off than other people, if the brim be wide enough to protect his neck and shoulders.

The greatest care must be taken, if work in the sun is found absolutely necessary, that the premonitions already detailed do not advance to complete prostration. In such a case discontinuance of work until the disagreeable symptoms have passed away would seem to be the only reasonable course. Persons who have once suffered from sunstroke are

unable for a long time after to bear exposure to heat without a recurrence of their former symptoms.

**Persons Unconscious from Exposure to Cold** require a special manner of treatment. The effect of excessive cold upon the body as a whole, and especially so in intoxicated persons who have lain down in the open air to sleep, is at first to produce unconsciousness, which, if warmth is not applied, will sooner or later pass into actual death. When excessive cold prevails the inclination to sit down or to lie down should be resisted, for this is the first indication of freezing. First a sleepy feeling creeps over one, and then loss of consciousness supervenes.

In order to restore a person from this unconscious condition warmth may not be rapidly applied to the whole body, but it should be thawed out by slow degrees. Furthermore, the limbs must be very carefully handled, to avoid fracturing any one of them, for cold renders them very brittle. The patient should be brought into an unheated room, undressed, and covered up to the nostrils and mouth with snow or powdered ice, with which he should be constantly and gently rubbed. The snow should be renewed as fast as it melts, until the skin begins to grow warm and the limbs relax. When its vitality has returned to the skin the snow should be removed and the whole body rubbed with cold cloths. Only now may

the temperature of the room be gradually raised and the patient placed in a tepid bath, and afterward in a warm one. From this point the treatment usual in the case of lethargic persons is to be instituted. The rescued individual must be restricted to a light diet for a day or two after emerging from the lethargy.

**Foreign Bodies in the Throat.** It not infrequently happens that a piece of food or some other body finds its way into the back of the mouth and lodges there, being unable to pass farther. In such case the finger, should this be thought best, will often be able to thrust the morsel downward. A hairpin, straightened and then bent at the extremity, may prove serviceable in dragging the impediment out. If the body is firm in character, we may be successful in drawing it upward by passing over it the looped handle of a scissors blade, separated from its fellow at the rivet. Fish-bones may be most readily removed from the throat by swallowing stale bread. The danger of suffocation by foreign bodies may be avoided by breathing regularly, by eating and drinking slowly, by refraining from conversation during meals, and by cutting the food into small pieces.

**Hemorrhage** is an accident of very frequent occurrence. In cases of severe bleeding, when the injury of an artery is indicated by the spurting of the blood in a steady stream from the wound, direct compression should be exerted upon the bleeding

artery, either by a finger inserted in the wound, or by means of whatever object happens to be at hand, such as moss, lint, tissue paper, or medicated cotton, until skilled assistance arrives. A more ready means of compression is sometimes found in tying the limb above the wound with a strong cord, an elastic band, or even a pair of suspenders. Above all, a bleeding limb should be so held as to impede to the utmost its circulation, the foot, leg, or arm, for instance, being held upwards. Slighter hemorrhages may be controlled by means of ice, cold water, burnt coffee, vinegar, or the methods of compression spoken of above. The application of a compress, however, is superfluous, for the coagulation of the blood in cotton, marine lint, oakum, and coffee is sufficient for the stoppage of hemorrhage. But the removal of these materials should not be hastened, for this may lead the bleeding to break out afresh. The physician, moreover, is the one to decide upon this point.

In case of **Nosebleed** it is sufficient in most instances to fill the nostrils with cotton or soft paper, and to leave it there for some time. Wads of cotton dipped in tincture of iron are only to be applied in slight and external hemorrhages. Indeed, one should be very careful in the use of this remedy, or should forego it altogether, for death has been known to follow immediately upon its use in cases of bleeding

from a tooth or from the nose, by the extension of blood-clots to the brain.

Just as there are men whose bones break at the slightest provocation, so there are others, also, the so-called "**Bleeders**," in whom hemorrhage of unusual difficulty to control occurs with remarkable facility. The cause of this condition seems to lie in an alteration of the walls of the blood-vessels.

Any person who has once suffered from a **Hemorrhage from the Lungs** or stomach should form the habit of carrying with him a dose of gallic acid or of ergotin, such as his physician may prescribe, or an abundant quantity of common salt, either one of these to be taken in emergency dissolved in water. If no water be at hand, the remedy will be of equal service taken dry. Furthermore, such a person should habitually keep as quiet as possible, should avoid hot food and hot drinks, as well as stimulants and excitations of any kind, should prefer not eating too much at one time, but rather more often, and should live in a well ventilated room, avoiding too warm or oppressive a temperature. The same rules hold good in respect to persons troubled with diseases of the heart.

In every case of **Injury**, in cuts, stabs, and gunshot wounds, in contusions, sprains, dislocations, and fractures, in burns, frostbites, and frozen members, the first measure to be adopted is the applica-

tion of cold in the form of ice, snow, or cold water. These substances are best applied in an animal bladder or a rubber bag. When towels wet in cold water are used, they require to be renewed every minute, for, unless frequently changed, they really act as poultices to the part, inviting what we wish to prevent. Cold not only stanches any bleeding which may occur, unless the hemorrhage is altogether too severe, but it also moderates the ensuing inflammation. The injured part must enjoy perfect rest and must be kept scrupulously clean.

In **Cuts** and lacerations of slight severity the edges of the wound should be pressed together as soon as the bleeding is stopped, and held firmly by strips of adhesive plaster. Deeper wounds the surgeon will close with sutures. The injured part must be held quietly, as a matter of course, in such a position that the wound shall not begin to gape again.

A vessel divided with a sharp instrument presents a more favorable outlet for the escape of blood than if torn across or severed by a dull blade or by a serrated one. Under the latter circumstances the minute fringes, or, as it may be, merely the slight roughness necessarily left about the edges of a vessel at the point of division retard the escape of blood and furnish nuclei upon which deposits of blood may take place in the shape of clots. Hence, if we leave other considerations out of sight, an in-

cised wound may be expected to give rise to more profuse hemorrhage than a contused or lacerated one.

**Lacerated Wounds** result from a rending or tearing of the parts. Such wounds often occur in the scalp, where a large fragment of skin sometimes becomes detached excepting for a slight pedicle. Never, under any circumstances, should such a fragment be removed, for the scalp is so richly supplied with blood-vessels that injuries to it, which to an ordinary observer appear of most unfavorable aspect, often heal notwithstanding rapidly and completely.

The same advice is to be enforced in regard to pieces torn from the nose or from the outer ear, since, even when cut entirely off and stitched on again, complete healing not infrequently occurs. The same is also to be said of wounded and torn fingers, even though they adhere to the hand by only a fragment of skin. All wounds should be stitched as soon as possible, for, if this be neglected, the margins will refuse to adhere at a later period, and so the healing process will be delayed or wholly prevented. The elasticity of the skin pulls the margins of an unsewed wound asunder, especially in the scalp, where erysipelas is so likely to supervene. Erysipelas is the name given to a form of inflammation which often starts in the edges of wounds. Its occurrence indicates the beginning of decomposition and the forma-

tion of pus, and such a condition is always to be regarded gravely.

The reduction of a **Dislocation** is to be advised at the earliest possible opportunity, as its neglect allows the muscles to stiffen, thus holding the limb more firmly in its displaced position. The delay of a few weeks renders a dislocation almost impossible to reduce.

**Fractures.** When an injury occurs to the lower limb, and it is thought that a bone has been broken, the injured person should lie where he has fallen, unless the temperature interdicts, until suitable assistance arrives. He should then be removed from the spot in a carriage, or preferably in an ambulance. A wagon well filled with hay will serve the purpose equally well, especially if the hay be so disposed as to form a hollow for the repose of the injured limb. Before removal long splints should be carefully bandaged to both sides of the limb without avoidable disturbance of the clothing. This is necessary in order to prevent, as far as possible, the grating of one fragment of bone upon another and the consequent destruction of the soft tissues, which is occasioned by the jarring of even the easiest riding vehicle, and which will inevitably make the injury far more serious.

**Abscess** denotes the gathering of pus. If this occur beneath the skin, and fluctuation can be felt

superficially, an incision should be made by a physician rather than allow the abscess to open of itself ; for, in the former case, the cut edges will unite rapidly, while in the latter the healing process will be long delayed, and a disfiguring scar will remain, as we so often see where a tooth has ulcerated through the cheek. Furthermore, it sometimes happens, especially if the skin is thick, that an abscess burrows beneath the skin instead of opening through it.

To **Burns** unsalted butter, fresh oil, yolk of egg, or cold cream should be applied at once. An especially good effect is gotten from linseed oil and lime-water in equal parts, or from bicarbonate of soda with the requisite amount of water to make a paste. Over such applications should be placed only a very light bandage, not a thick one which will generate warmth. If the burn is superficial, pencilling with collodion will be found of service before the formation of blisters, by preventing them from forming. Blisters caused by burns, when they do not evacuate spontaneously, should be opened with a clean needle upon the second day, and the tract should then be overspread with one of the applications already enumerated. The skin should not be hastily removed from the blister, for its presence protects the wound. If adjacent parts, such as the fingers or the arm and chest, become involved in an extensive burn, measures must be taken to keep them apart

during the process of healing, in order that they may not grow together. Pieces of linen soaked in emollient applications should therefore be placed between the opposing wounded surfaces.

When any one's clothing catches fire, he should immediately be thrown down upon the ground, so as to lessen the tendency of the flames toward his mouth and nostrils. Then, without a moment's delay, he must be rolled in the carpet or hearthrug, in order to stifle the flames, his head alone being exposed that he may be able to breathe. If no carpet or rug is at hand, take off your coat and use it instead. Keep the flame as much as possible from the face, so as to prevent the entrance of the hot air into the lungs. This can be done by beginning at the neck and shoulders and smothering the flame downward. Should any fragment of garment be found adherent to the burned surface, it should not be separated, as the violence required to remove it necessarily increases the damage to the injured part.

Burns by lime, caustic potash, and other alkalies are as a rule very troublesome, since not only removal of the cuticle or superficial skin occurs, but also destruction of the soft parts beneath. Lime is a powerful alkali and rapidly destroys the parts with which it comes in contact. It is useless to attempt to pick it off, for the fingers remove no more than they come in contact with; so an application

should at once be made of some substance which will unite with the alkali to form a comparatively harmless preparation. To accomplish this we may apply lemon juice, vinegar diluted with water, or any other dilute acid. These acids do not undo what has been done: they only prevent farther mischief. What we say in regard to lime may also be said of potash, soda, ammonia, and the other alkalies.

Burns by sulphuric acid (oil of vitriol), nitric acid (aqua fortis), and other acids. Just as alkalies destroy the living tissues they come in contact with, so too do acids of sufficient concentration. In such cases the addition of water will dilute them beyond their capacity to injure. The admixture of alkalies, such as lime-water or bicarbonate of soda, neutralizes acids into harmless preparations. Common dry earth, gathered almost anywhere and thrown in handfuls upon the injured surface, contains enough alkali of one kind or another to entitle it to the consideration of being one of the best, and at the same time one of the most easily obtained applications in cases of burns by acids.

A **Hernia**, or rupture, often menaces life by becoming incarcerated, that is when a portion of intestine becomes constricted by the convulsive grasp of the muscles about one of the abdominal openings. Under these circumstances there may develop a violent peritonitis, attended by severe pain, and followed

by gangrene and other fatal consequences. The symptoms of incarceration are pain at the seat of rupture and in the abdomen, constipation, belching of wind, vomiting, sometimes vomiting of fecal matter. In order to prevent such an incarceration a hernial patient should keep close watch for its earliest symptoms, and especially for pain in the tense, hard tumor, which, from being quite relaxed and readily replaced, has become hard, rigid, and altogether irreducible. Upon the appearance of symptoms of incarceration a competent physician should be summoned as soon as possible, who will endeavor to reduce the hernia by pressure, but, if he fail in this, will not delay in replacing it by operation.

Incarceration is the result of a spasmotic contraction, and every hernial patient should keep always at hand, by way of precaution against the occurrence of so serious an accident, a dose of opium or chloroform prepared by his physician. But if he has a well-fitting truss, and knows how to adjust it, he will experience no farther inconvenience from his infirmity, and need not fear to engage in his ordinary avocations or even to make considerable physical exertion. His truss, however, must be obtained while the hernia is still movable and not too large to be returned into the abdominal cavity. He must also keep his bowels regular and refrain from excesses in

eating. If the patient observes that his hernia is pressing out from beneath the pad, he must at once consult an expert. He must remember that the compressing power of a truss diminishes with use, and as soon as he finds that his truss no longer confines the hernia, another must be procured. If the means of the patient allow, it is well for him to have several trusses, in order to be able to make a change in case of necessity. The steady pressure of a good truss is capable of bringing about, especially in young persons, a union of the walls of the empty sac, and thereby a radical cure. The continuous wearing of a well-fitting truss, both by day and by night, is an indispensable condition to the growing together, where possible, of the sac-walls, and to the prevention of increase and of incarceration in the hernia.

The treatment in cases of **Poisoning** requires the stomach to be emptied as quickly as possible of the poisonous substance by means of vomiting, purging, or the stomach-pump. Tickling the membrane of the throat with the finger or with the tip of a feather is in many instances sufficient to induce vomiting. Usually after the giving of an emetic - this means is used to hasten its action. Common salt serves a useful emetic action when dissolved in the smallest quantity of water which will absorb it, and given every minute until vomiting occurs. Another valuable emetic, particularly for children,

is pulverized ipecacuanha, which can be had of any druggist. Warm water is very commonly used to produce vomiting, and so too is mustard mixed in warm water. After vomiting is begun there is usually little trouble in keeping it up by simply giving a plenty of tepid water.

When the stomach cannot be emptied completely or rapidly enough, the poison ingested should be rendered as harmless as possible by chemical decomposition with antidotes, by combination with some other substance, so that a less harmful product is obtained, or by concealing and diluting it. With this view the albumins and the tannins are chiefly to be employed, the former in cases of poisoning from mineral acids and metals (other than antimony), because these form an insoluble combination with albumin, the tannic preparations (tannic acid, willow and oak barks, green tea, and quinine), when the poison is an alkaloid, that is with most forms of vegetable poisons, and with antimony.

In the treatment of poisoned wounds we may apply lime-water, chlorine water, solution of potassium permanganate, or actual caustic, which not only neutralize the poison, but obliterate the wound as well. For cauterization any one of the concentrated mineral acids is to be preferred ; chloride of antimony, caustic ammonia, or caustic potash may be adopted ; or the same result may be attained by

the application of the cautery iron, or, in case of necessity, of a heated poker or a cigar.

Finally, the dangerous consequences of the poisoning must be overcome by suitable measures, depression for instance by stimulants, and over-stimulation by depressants.

**Mineral Poisons** can be rendered harmless, or at least modified in effect, by the administration of large quantities of warm milk, albuminous fluids, demulcents, or oleaginous liquids, at the same time exciting continual vomiting. Fatty substances, however, must not be given in phosphorus poisoning, on account of the ready solubility of phosphorus in fat.

**Arsenical Poisoning** calls for the immediate induction of vomiting and the administration of hydrate of magnesia, which may be readily obtained by adding calcined magnesia to twenty times its quantity of water. When nothing else is at hand, the rust-colored mud may be given, which is to be found at the bottom of every blacksmith's and locksmith's extinguishing-barrel. A remedy of high repute in such instances is a mixture consisting of seven drachms of protosulphate of iron, three of magnesia, and half a pound of water, a tablespoonful to be taken at a time.

**Copper Poisoning** and poisoning from verdigris is to be treated, after vomiting is secured, by giving large quantities of warm albuminous water, mag-

nesia, or milk. An excellent preparation consists of an intimate mixture of seven parts of moistened iron-filings with four parts of flowers of sulphur.

**Mercurial Poisoning** is to be met by an immediate exhibition of demulcents and of substances designed to disguise the mineral and to render it insoluble. Such a remedy is fluid albumin, the white of an egg, for instance, given every two minutes in abundance of water. In its absence the same effect may be reached by copious draughts of milk or of thin flour paste. During the period of recovery the patient should be fed only upon broths, milk, and demulcent drinks. The removal of the poison from the system may be aided by administering iodide of potash, and salivation may be diminished and the fetid odor of the breath overcome by a wash of chlorate of potash, two parts in one hundred of water.

**Nitrate of Silver Poisoning.** Milk and egg-albumin are excellent antidotes, but the best is a strong solution of common salt.

**Antimonial Poisoning** requires as antidotes the tannic preparations, including the decoctions of tannin, oak, and willow bark, quinine, tincture of galls, and black coffee. Tannin itself is the most efficacious, but the preparation most readily obtained is the familiar one of Chinese tea. In urgent cases magnesia, soap-suds, or the white of an egg may render service.

**Acute Lead Poisoning** is treated by inducing violent vomiting and by giving draughts of magnesia sulphate in solution and of salt water. In emergency albumin and milk may be substituted. In cases of lead colic warm wrappings should be applied to the abdomen, and frequently warm enemata should be administered and followed by opium and castor-oil.

Chronic lead poisoning may result in recovery through attention to a nourishing diet, including rich milk, to fresh air, to regular bathing, and to the periodical action of the bowels. In cases where lead paralysis supervenes stated electrical treatment by a physician is indispensable, and massage may be serviceably employed. Iodide of potash is the most efficient agent for removing lead from the system.

Chronic lead poisoning is of frequent occurrence among workmen who come in daily contact with the metal. But it is also innocently incurred in not a few instances by persons whose exposure is only incidental. Among such unsuspected means of conveyance may be enumerated the habitual drinking of water which passes through lead pipes, and the use of cosmetics containing lead.

Free ventilation and scrupulous cleanliness constitute, in general terms, the most efficient safeguards for those whose occupations involve prolonged exposure to lead and other poisons brought into the system through the agency of the atmosphere.

Workmen employed in lead factories and those otherwise exposed to lead should be compelled to wash their hands and change their outer clothing before eating. They should also bathe regularly every day upon leaving their work, and under no circumstances should they be suffered to eat or sleep in or near the workshop. Inasmuch as not all processes involved in the manufacturing of lead preparations are attended with equal risk, the workers should from time to time be transferred from one department to another or from indoor to outdoor work. In order to prevent the constant rising of dust charged with lead particles, floors should be frequently sprinkled, or kept covered with moist sawdust.

**Phosphorus Poisoning**, which most frequently follows accidents with rat-poison or with matches, is indicated by the vomiting of matter with an odor like garlic and luminous in the dark. The best emetic is sulphate of copper, which should be followed by copious draughts of some demulcent, with white of egg, by the administration of calcined magnesia, or by that of thin flour paste. Fatty substances are wholly inadmissible, for they facilitate the solution of the poison.

**Mineral and Vegetable Acids** (sulphuric, nitric, hydrochloric, oxalic, acetic, tartaric, and citric acids, and oil of vitriol) demand alkalies, especially mag-

nesia, with milk, oil, syrup, or gelatine, lime-water, and in circumstances of emergency chalk or egg-shells in water, soap-suds, ashes, saleratus, and after these copious draughts of water, milk, demulcents, oil, or flour paste. Above all, the drinking of large quantities of water, albuminous fluids, and soap-suds is to be advised. In cases of poisoning from oxalic acid or oxalic salts lime-water is to be given without delay, or else magnesia, ground lime, or chalk.

**Alkalies** (soap-lye, potassa, carbonate of soda, caustic ammonia, and carburet of lime) may be neutralized by the free drinking of acid beverages, such as lemonade, solution of tartaric acid, vinegar, and also, for the protection of the mucous membrane of the stomach, of oils and demulcent drinks. If the external skin is injured by carburet of lime, the lime must not be removed by water, but by oil.

**Vegetable Poisons** as well as mineral must be removed by vomiting, or by the stomach-pump in the hands of a physician, and their traces obliterated by means of copious demulcent drinks. Afterward, in the case of most of these poisons, a decoction of some tannic substance is to be given, along with strong black coffee or strong tea, while stimulating enemata of vinegar are administered in connection with vinegar baths. Upon the arrival of unconsciousness or stupor the patient should be treated as directed in the section entitled "Trance," especially artificial

respiration by forcing air in and out of the lungs being resorted to, and continued, if necessary, for some hours. Another serviceable measure is the persistent application of cold, especially of ice wrappings, to the head. For an unconscious condition of milder degree we may employ frequent sprinkling of the face with cold water and continual exercise of the patient to prevent his falling asleep. For this purpose the poisoned individual should be led up and down the room between two attendants, if necessary for some hours, no matter how much against his will it may be. To prevent general exhaustion and weakness, wine, Hoffmann's anodyne, and other stimulants should be given.

The characteristic symptoms of acute Opium Poisoning are deepening stupor and drowsiness, contraction of the pupils, retarded breathing, slow pulse, contractile movements of the skin, and finally coma and general paralysis. If a physician is present, he will administer atropine or belladonna; but these drugs require to be used with skill, and a layman should confine his efforts to the general measures of relief referred to in the last paragraph. He will be apt to find especial benefit in the use of strong black coffee, vinegar baths, and artificial respiration by pressing upon the abdomen at intervals of five seconds. Above all, he should not omit to induce vomiting, and that repeatedly.

**Prussic Acid Poisoning** is marked by sudden paralysis of motion and respiration, by unconsciousness, by tremblings and convulsions, and by small pulse and cold extremities. On account of the great rapidity of action which characterizes prussic acid when taken into the system the stomach-pump is the only method available for its removal, unless tickling the throat may succeed in producing rapid emesis. No true antidotes exist. In order to restore nervous energy and respiration strong stimulants should be given, ether, camphor, and cold douches to the head and spine, as well as artificial respiration.

**Belladonna Poisoning** manifests itself by causing expansion of the pupils, disturbance of visual power, diminution of feeling, dizziness, and muscular contractions. The unconsciousness which succeeds often leads to delirium, hilarious or furious in character as the case may be, while the throat suffers from dryness, tickling, and an inability to swallow which sometimes actually simulates the convulsions of hydrophobia. In the hands of a physician opium and morphine are the proper antidotes, but a layman should venture to employ nothing more dangerous than the vegetable preparations already enumerated. Subsequent disturbances of vision should be treated by the local and internal use of the calabar bean.

**Stramonium** and **Hyoscyamus** act in a similar manner to belladonna, as also does **Tobacco**. The

strong narcotic poisons, **Hemlock**, **Colchicum**, **Aconite**, and **Ergot**, present also the symptoms of inflammation of the stomach and intestines, such as colic, tenesmus, and bloody diarrhoea. **Digitalis** has the farther effect of slowing considerably the pulse and the heart-beat. In cases of poisoning by any one of these drugs the vegetable and other antidotes already referred to are to be employed.

**Strychnia** is the active principle of the "dog-button," or *nux vomica*, as it is called from the use often made of it. The action of this poison is so rapid that, as in the case of prussic acid, little can be done to delay death. It has a peculiar power over the nervous system, throwing the muscles of the body, and especially those of the legs and head, into violent convulsive movement. The stomach must be evacuated with the least possible delay, and, if asphyxia results from the convulsive movements of the chest muscles, artificial breathing should at once be tried, in the hope of inviting back natural respiration. The best antidote is hydrate of chloral. Others are tannin and the narcotics, among them opium, morphine, and especially chloroform, of which latter, as a rule, a large amount can be borne.

**Toadstools** usually manifest their noxious effects very slowly, for the poison symptoms frequently appear only after the delicacy has been ten or twelve hours in the digestive tract. Therefore, besides en-

ergetic measures for inducing vomiting, purgatives and enemata are to be employed, such as wine of antimony with Glauber's salts, or, if violent pain in the abdomen exists, still better with castor-oil. After evacuation of the toadstools vinegar should be given, or mild ethereal remedies. Atropine in minute doses acts as a genuine antidote.

**Acute Alcoholic Poisoning** presents among other symptoms dilated pupils, scarcely perceptible pulse, and sometimes convulsions and paralyses. The noxious principle may enter the system through the skin, the lungs, or the mucous membrane of the stomach. Bernard found that the process of digestion ceased at once in the stomach of a dog upon the introduction of clear alcohol. In the same manner, when alcohol was mixed with the food, digestion did not commence with the same promptness as when food alone was taken. Very small quantities of pure alcohol are enough, as a rule, to bring on symptoms of acute poisoning in a very short time. These statements show that alcohol ought to be regarded rather as a poison under whatever circumstances than as an article of common consumption, and that, no matter how diluted, it cannot fail of having a toxic action upon any animal tissue encountered. Like many other poisons alcohol is to be considered as one of the most valuable drugs at the service of the physician.

The treatment of acute poisoning by alcohol calls for the removal of the poison from the stomach either by emetics or by the stomach-pump, the application of cold to the head, the use of stimulating enemata with salt and vinegar, the administration of strong black coffee, and the employment of artificial respiration.

The treatment of poisoning from noxious **Gases** is the same as that already directed in the case of "persons suffocated." Acid gases, that is the gaseous acids of the mineral kingdom, such as sulphuric, nitric, and hydrochloric acids, are injurious to the eyes and lungs, and, when inhaled in considerable quantities, produce fainting and suffocation. Workmen in factories where these acids are used should seek protection, in addition to that given by effective ventilation, in such devices as keeping before the mouth a sponge soaked in potash solution, wearing glasses whose rims are surrounded by similar sponges, and stopping the ears with cotton steeped in oil.

**Chlorine Gas** causes extreme irritation of the respiratory tract, and must therefore be excluded by such means as those just described. Since water has a strong affinity for chlorine, large buckets of water should stand in every factory where the gas is found. In cases of poisoning from chlorine the inhalation is to be recommended of steam, chloroform, ether, or alcohol.

**Carbonic Acid Gas** and carbonic oxide gas are attended by the danger of speedy suffocation. Illuminating gas in particular must be handled with the greatest care. Carbonic acid is, moreover, a true poison, and acts as such directly upon the human system. Carbonic oxide is still more inimical to life, and enfeebles the blood in particular by expelling the oxygen from the blood-corpuscles and replacing it in equal quantity itself.

The removal of the person poisoned out of the dangerous atmosphere must, as a matter of common sense, be the first measure of our treatment. Farther directions have been given in the section upon "persons suffocated."

**Animal Poisons** are chiefly carried into the circulation from small wounds or abrasions of the skin. The first need, therefore, is to protect the skin, especially in injured localities. The next is to prevent the entrance of the poison into the circulation. With this aim it is best to destroy the poison at once in the wound where it originated by means of caustic potash, nitric acid, sulphuric acid, caustic ammonia, soda, or by actual fire, the hot iron, or a lighted cigar. An iron at white heat gives less pain than one "black hot," as smiths say; for in the latter instance the heat is scarcely sufficient to destroy, but only irritates, while in the former the greater heat at once destroys the vitality of the part with which it comes

in contact, and with other tissues the nerves which convey the sensation of pain. With a properly heated iron not only the surface is destroyed, but the destructive influence extends beyond and into the healthy tissue far enough, if no point is neglected, to ensure the purpose for which it is used.

Caustics, however, are not always at hand when such an accident occurs, so the poison should at once be drawn from the wound by sucking it with the mouth, and for a considerable period of time. In this there is no danger when the mouth is free from wounds, especially if the matter sucked out is expectorated with the saliva and the mouth is frequently rinsed clean. After evacuation of the poison the wound should be carefully washed, if possible, with caustic ammonia, salt water, vinegar, soap-suds, or even with urine. When bleeding is profuse from the wound, the poison is frequently washed completely out, and therefore bleeding is to be prolonged, when necessary, by incisions, by warm applications, and by cupping. In order to retard the entrance of the poison into the circulation, the blood-vessels supplying the region should be obstructed by close compression or by ligation as near as practicable to the wound, and upon the side of it toward the heart. Then the wound should be thoroughly treated with caustic, but not to an immoderate degree, or, still better, with the hot iron. It seems beneficial for

some days afterward to practice the drinking of hot water.

**Hydrophobia** may occur, contrary to the popular opinion, at any season of the year. The avoidance of water is a very marked symptom in man, but no mad dog avoids water. Mad dogs cannot properly be said to foam at the mouth, but those whose cheek muscles are so relaxed that their jaws hang open necessarily drop some saliva or mucus. Quite as untrue is the idea that mad dogs always run straight ahead and always carry their tails between their hind legs. Such a manner of conducting himself gives to a dog the appearance not so much of being vicious, as of being simply sick. Mad dogs are apt to be very quiet, sluggish, and sullen, and to slink away by themselves: others, however, become restless and irritable, and bite and run away. Most such dogs lose their appetite, but they swallow very abnormal substances, such as earth, straw, and shreds of cloth. Mad dogs all bark in a peculiar manner, and this is a characteristic feature of the disease. Their proclivity for biting exhibits itself rather against animals than against men, and sometimes they confine themselves to snapping at inanimate objects: yet they do not always spare their masters. They bite in a noiseless, insidious manner, without previous barking or snarling. Death fol-

lows eight or nine days later. The recognition of hydrophobia, it will accordingly be seen, is not without difficulty, and for this reason it is to be urgently recommended to every owner of a dog, that, so soon as he perceives in the animal any departure from his usual condition and behavior, immediately the object of suspicion should be secluded from mankind.

A dog who has bitten a human being is very apt to be slain at once by the bystanders. This should not be permitted, but the suspected animal should be placed in confinement and watched under proper safeguards for the appearance of the disease. Should no indubitable symptoms indicate the disease in the dog, it can be readily seen what unnecessary mental distress will have been saved both to the person bitten and to his friends.

A number of well authenticated instances are on record where the bite of the common skunk or polecat has been followed, after the usual period of incubation, by symptoms of rabies. Out of the forty-one cases recorded all except one, a farmer, who knew of the danger and took the precaution of using prompt preventive treatment, ended in death. Persons so injured should promptly resort to the peculiar measures advised for the treatment of poisoned wounds.

**Snake Poison**, which, very soon after the bite of the serpent, causes violent incisive and radiating

pains, as well as a dark bluish swelling of the wounded region, and later dizziness, difficult breathing, and stupefaction, is a colorless, odorless, viscid fluid, very similar to olive oil. The poison of some tropical snakes occasions no local symptoms, because death follows only a few minutes after the bite. Neither chemical nor microscopical research has hitherto furnished a satisfactory explanation concerning these poisons. Their manner of operation too is still quite obscure. Their effect is produced only by direct contact with the blood, which they appear to have the property of decomposing with great rapidity. The venom of a snake has no poisonous action when introduced into the stomach.

The poisonous snakes are sluggish creatures, which seldom attack men unless provoked. The effect of their sting is proportioned to the amount of venom accumulated. Whoever is bitten by one of them should at once suck out the wound and apply one of the above named cauterants. Prompt amputation of the injured part may be successful in saving life. In any case a ligature should be applied, if possible, above the wound, to be relaxed, if much swelling occurs, and again tightened when feasible. The instantaneous use of potassa, soda, or, still better, of a dark red solution of permanganate of potash, or of the same chemical in dry condition used

both externally and internally, very often proves beneficial, as does the practice of the Italian shepherds of urinating upon the wound.

The slower action of the heart, which is indicated by a feeble pulse and by other appearances of prostration, calls for the free use of stimulants. Marvelous stories are told of the quantities of whiskey and brandy taken under these circumstances by persons not addicted to their use. It is often wise to give them freely at brief intervals until symptoms of intoxication appear. The great enfeeblement of the heart readily suggests laying the injured person upon his back, since this is the position in which the powers of the heart are least taxed.

In the cool season of the year snake-poison very seldom has a fatal effect. An excellent precaution to take, where children are found in the open air exposed to the bites of snakes, is that of allowing fat hogs to run about unhindered, for swine are insensible to the bites of rattlesnakes and many other species of poisonous reptiles, and consequently are their most formidable opponents. Very exciting contests are said to take place between certain South American snakes and a species of large lizard, where the latter always comes off victorious. The lizard is, of course, frequently stung by the snake, but resorts as often to a certain shrub, by making use of whose

power to neutralize poisoned wounds it always escapes unhurt.

Among the members of the spider family found in tropical and sub-tropical regions **Scorpions** and **Tarantulas** are the most dangerous. Caustic ammonia, followed by some oil, will be found most serviceable in their treatment.

**Insect Bites** are capable of becoming at times very dangerous and even fatal, especially when the insect has rested upon decomposing animal or human bodies, and it is a wise precaution therefore to treat such a wound in the same manner as those made by poisonous creatures. Mosquitoes, wasps, hornets, and bees may produce violent inflammation and swelling. First of all, in such cases, the sting should be carefully extracted, and then caustic ammonia, cold water, or vinegar should be applied to the wound. If a swelling of considerable extent arises, a mixture may be applied of equal parts of caustic ammonia, sugar of lead, and linseed oil.

For the relief of a **Mosquito** bite the best application is the aromatic spirits of ammonia. The insect can be kept from alighting, however, by rubbing the skin of exposed parts with a piece of lemon, or by coating it with vinegar or with a saturated solution of boric acid. **Bedbugs** may be destroyed by applying kerosene oil, or still better

concentrated acetic acid, to the crevices frequented by them.

**Glanders**, when communicated to man by an affected horse, mule, or donkey, must immediately be treated by washing the infected wound with chlorine water or spirits of turpentine and applying a chemical caustic or the actual cautery.

## CONTAGIOUS AND MIASMATIC DISEASES.

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Medical science has made many of its most rapid strides in recent times in an effort, by no means unsuccessful, to increase our knowledge of diseases which are communicable in some manner from one individual to another. An incentive to this study as well as a result of it lies in the certainty that a due attention to necessary precautions will enable us, in a large number of instances, to escape these diseases.

Among the graver varieties of disease which a physician is called upon to treat we include the **Contagious**, in which the germs of disease are conveyed directly from one individual to another, and the **Miasmatic**, in which the disease-germ, the so-called miasm, develops for the most part beneath the surface of the ground and thence is conveyed to its destination by the forces of air or water. Among contagious diseases may be enumerated smallpox, scarlet fever, diphtheria, measles, whooping-cough, inflamed eyes of newborn children, syphilis, and typhus fever. In another class of diseases the probability of personal contact is reduced to a minimum

as an element of causation, while the miasmatic origin of the poison cannot be overlooked. In this latter class the malarial diseases are universally included. With regard to a third group there is still dispute whether the disease can be transmitted directly from person to person, but all are agreed that the infected individual can infect a locality. Here we find included typhoid fever, cholera, and the plague, and to this group the name of **Miasmatic-contagious** is commonly applied.

The germs of the contagious and miasmatic diseases are known to belong among the lower forms of life, whether more properly in the animal or in the mineral kingdom has not been determined. To them the collective name of bacteria is given by scientists, a name, however, which includes as well many species which give no evidence of being harmful, and some which are certainly beneficial to mankind. Bacteria occur in earth, air, and water in incredible numbers. It is a mistake, however, to suppose, as alarmists imply, that disease-germs lurk in every crevice, are floated upon every wave, and are blown to us by every breeze. Nevertheless, they are sufficiently abundant and sufficiently virulent, under many conditions, to necessitate careful precautions whenever danger of infection is thought to exist.

The bacteria of disease, while of infrequent occur-

rence in the atmosphere, may be detected quite generally in soil and water in the vicinity of human settlements, and especially where they have been deposited from the dejections of the sick. They are capable in some instances of transportation for long distances by currents of water either above or beneath the surface of the ground. They may remain an indefinite length of time within the soil without losing their activity in the production of disease, a fact often attested upon the disinterment of bodies long buried. They have been known to linger many years in garments, which have been used in the sick chamber where contagious disease existed, and which have then been packed away without proper disinfection. Particularly is the latter the case where scarlet fever has prevailed.

Professor Welch, of Baltimore, says, in an address upon this subject, "Manifold are the ways in which we may be brought into contact with infectious bacteria in the ground, either directly or indirectly by means of vegetables to which particles of earth are attached, by the intervention of domestic animals, by the medium of flies or other insects, and in a variety of other ways more or less apparent.

"An important, doubtless for some diseases the most important, medium of transportation of bacteria from an infected soil is the water which we drink or use for domestic purposes. It is not the

subsoil water which is dangerous, for infectious, like other bacteria, cannot generally reach this in a living state, but the danger is from the surface water and from that which trickles through the upper layers of the ground, as well as from that which escapes from defective drains, gutters, cesspools, privy vaults, and wrongly constructed sewers, or improper disposal of sewage.

"Pathogenic bacteria may preserve their vitality longer in ice than in unsterilized drinking water. Thus, Prudden found typhoid bacilli alive in ice after 103 days.

"Among the various agencies by which infectious organisms may gain access to the food may be mentioned the deposition of dust conveyed by the air, earth adhering to vegetables, water used in mixing with or in the preparation of food, in cleansing dishes, cloths, etc., and contact in manifold other ways with infected substances.

"Fortunately a very large part of our food is sterilized in the process of cooking shortly before it is partaken, so that the danger of infection from this source is greatly diminished, and comes into consideration only for uncooked or partly cooked food, and for food which, although it may have been thoroughly sterilized by heat, is allowed to stand a considerable time before it is used. Milk, in consequence of its extensive employment in an unsteril-

ized state, and of the excellent nutritive conditions which it presents to many pathogenic bacteria, should be emphasized as especially liable to convey certain kinds of infection—a fact supported not less by bacteriological than by clinical observations. Upon solid articles of food bacteria may multiply in separate colonies, so that it may readily happen that only one or two of those who partake of the food eat the infected part, whereas with infected liquids, such as milk, the infection is more likely to be transmitted to a larger number of those who are exposed.

“In another important particular the food differs from the other sources of infection which we have considered. Not only the growth of infectious bacteria, but also that of bacteria incapable of multiplication within the body, may give rise in milk and other kinds of food to various ptomaines, products of fermentation, and other injurious substances, which, when ingested, are likely to cause more or less severe intoxication, or to render the alimentary tract more susceptible to the invasion and multiplication of infectious organisms.”

The agencies by which bacteria may be sterilized or destroyed are heat, cold, and chemical action, the latter consisting in contact with certain “antiseptics,” among which we may mention corrosive sublimate and carbolic acid as being especially effective. In order that the bacteria of infectious

diseases may exert their activity a suitable "soil" must be furnished in the persons of those subjected to their attacks. Such activity is always favored by ill health, starvation, bad air, especially when contaminated with sewer-gas, by unhealthy occupations, the use of alcohol, and by whatever else tends to deplete the vitality of the individual.

When a number of persons are taken sick in the same neighborhood at one time with similar symptoms, the outbreak is termed an "epidemic" or "pestilence." If the same disease returns often to a given locality, or if it remains there continuously, it is said to be "endemic" or domesticated. When cases of sickness multiply and a disease becomes epidemic, the utmost care should be exercised by everyone to avoid exposure in any way to the germs of contagion.

A principal source of many dangerous diseases, and not alone of those which are epidemic in tendency, but especially of cholera, typhoid fever, yellow fever, and the plague, lies in the decomposing excrements of human beings, and more particularly of those who are sick. The greater the degree of cleanliness observed in regard to the removal and disinfection of such materials, the more certainly do we by these means secure our own health.

Porous objects and those which are dark-colored or rough seem to absorb and to retain the germs of

miasma and of contagion more readily, and probably also in larger quantity, than those which are dense, smooth, and light in color. For this reason dark woolen uniforms should not be worn by professional nurses; and physicians, upon leaving such a patient, should take the precaution of at once changing their clothing and thoroughly disinfecting that they have worn. At the same time those who wear beards should thoroughly cleanse them. It is far simpler and more cleanly, however, if no beard be worn.

The most frequently encountered of the endemic diseases are the **Intermittent** and **Malarial Fevers** which originate in the neighborhood of swamps. Any one who is forced to live in a malarial region should exercise great care in avoiding the damp, misty air of evening, especially if he is not acclimated, and equally the heavy dew of the morning, or, if he finds it impossible wholly to avoid these, he should at least keep himself in constant motion at these seasons of the day. He should wear next his skin a long woolen undershirt, should indulge frequently in warm bathing, should carefully avoid getting wet and catching cold, should not lie down on the ground nor sleep in the open air, should occupy a dwelling and especially a sleeping-room as high above the ground as may be, should avoid the vicinity of newly broken ground, should combat the malarial drafts of air near the floor by means of a

fire, should live frugally and temperately, avoiding excesses of every sort, and should refrain from eating indigestible fruits, fish, or vegetables, and particularly in the form of salads. He should not go about with an empty stomach, should drink no impure water, but should purify his water before drinking by boiling or filtering.

Intermittent and malarial fevers owe their origin as a rule to air contaminated with carburetted hydrogen and with other gases which spring from decomposing vegetable and animal substances or from freshly broken ground. The draining of swampy regions is regularly followed by the disappearance of malaria. In many cases malaria is due rather to bad sewerage than to natural surroundings, and thus is traceable to human neglect rather than to faults of nature. Intermittent fever is distinguished from malarial by the regularly recurring intervals which separate the paroxysms of fever.

The diet in malaria should be very light, excluding fruit and raw vegetables. Lemons and lemonade, however, may be freely indulged in as possessing germicide properties. Wherever possible, red pepper should be added to the food, its strength being ameliorated by the use of boiled milk, sugar, and other bland articles. The drugs prescribed by the physician should be continued some time after the disappearance of symptoms. Malaria is liable to

reappearance upon leaving a malarial for a non-malarial district, and even upon undertaking an ocean voyage; therefore anti-malarial remedies should be renewed at every such time.

## TYPHOID FEVER.

Typhoid fever is a very treacherous disease, whose termination can never be foreseen with certainty. It may be prevented by prompt disposal of all decomposing substances, such as diseased meat, tainted sausage, spoiled fish, poisoned cheese, contaminated milk or water, by immediate removal and disinfection of the excrements, by thorough cleanliness in every respect, by adherence to a diet of nourishing, easily digestible food, by drinking no water but that which has been boiled, by observing regular habits of life, by maintaining good spirits, by refusing to live in any but a healthy house. Sewer gas, escaping in a house, forms an especial menace to health. Enough cannot be said by way of warning against excesses, during convalescence from this disease, in eating articles difficult to digest, or in partaking of foods and drinks which have a tendency to overheat, to bloat, or to irritate the stomach. Such indulgence not rarely proves fatal. Furthermore at this time all

edibles should be avoided which contain stones, kernels, skins, and husks, for the passage of these substances through the intestine is liable to tear the tender membrane from freshly healed typhoid ulcers, and even, by opening a passage into the abdominal cavity, to cause fatal results.

“Two methods of prevention, having the same general object in view, are to be recommended. The first involves the thorough disinfection of all discharges from the bowels of typhoid fever patients. This is best done by the use of a solution of chloride of lime, eight ounces to the gallon of water, using a quart of this solution for each discharge, and allowing it to stand in the vessel at least an hour before emptying. A solution of corrosive sublimate, two drachms to the gallon of water, will answer the same purpose, but requires to remain longer in contact with the material to be disinfected. Bed and body linen soiled by such patients should be disinfected by the use of the same solution or by boiling.

“The second method relates to avoiding the use of suspicious water, and especially well water, and where this cannot be done, to boiling such water before it is used for drinking purposes. In the absence of a pure and well-guarded public water supply, properly stored cistern water is probably open to least objection.”

## YELLOW FEVER.

Yellow fever occurs only in tropical and sub-tropical countries along the coast and in the low lands about rivers, but never in mountainous districts. The disease attacks chiefly the unacclimated, and especially those who live in a manner unsuited to the climate, overloading their stomachs with meat and with indigestible fruits, indulging in intoxicating liquors, exposing themselves to the night air and dew, and paying insufficient attention to cleanliness of person, clothing, and dwelling. Yellow fever is attended with very rapid decomposition of the blood, with vomiting of blood, and with jaundice. Migration to a mountainous region is the surest means of protection against this fever. Those who are unable to leave the infected locality should at least spend their nights in as high, cool, and airy a building as possible, outside city limits, and preferably upon a sandy soil. A city frequently infested with yellow fever is Rio de Janeiro, and chiefly for the reason that an overhanging mountain (which, however, must sooner or later be removed) obstructs the access of the trade winds, and so interferes with the ventilation of the city.

“ For persons detained in an infected city by duty or necessity the best advice that can be given is to maintain a cheerful frame of mind ; avoid excesses

of all kinds ; keep away from centres of infection (as shown by the occurrence of numerous cases); sleep as far from the ground as possible ; keep the bowels open. In malarial localities it is well to take prophylactic doses of quinine, as an attack of malarial fever, like anything else that disturbs the balance of health, is very likely to eventuate in an attack of the prevailing disease.

“ Many cases are of so mild a type that recovery may take place under the most adverse circumstances and even in spite of heroic treatment. On the other hand, certain cases are of so malignant a character that no amount of skill and care can avert a fatal termination. But between these extremes is a considerable number of cases in which the balance of life and death is in the hands of the attendant. An ill-timed cathartic, a discouraging word, permission to sit up, or to partake of solid food, exposure to drafts, in short, many things which to the inexperienced may appear trivial, when thrown into the balance, in this disease, may turn the scale to the fatal side. On the contrary, encouraging words to the patient, vigilant supervision of all that occurs in the sick-room, the timely administration of stimulants, and in short, close attention to all the details of what is known as ‘nursing’ will tide many a patient over the critical periods of the disease, and save his life.”

# DISEASES OF THE NERVOUS SYSTEM.

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## HYSTERICAL ATTACKS.

Hysterical attacks are occasioned in some instances by mental impressions, in others by disturbances of one or another organ, and especially of the organs of generation. The origin of this malady seems to lie in a certain physical, or, more correctly perhaps, in a certain psychical makeup of the individual. The fact that women of strong wills, domestic capacity, and active inclination are almost free from hysteria may be taken as evidence that it is possible to prevent its occurrence in most instances by a judicious bodily and mental training. The physical training should be so directed as to overcome any tendency to effeminateness. The moral sense and the inclination to useful activity must be aroused and developed. Force of will must be cultivated, in order that the woman may gain power to maintain a mind free from all sentimentality and constantly under the control of reason. When a woman comes into circumstances which force her to prove her skill in useful occupations, or when a happy marriage, richly blessed with children, brings

to her the necessity of planning daily for the education, the food, the clothing, and all the other details, which make up the sum of comfort for her household, all nervous manifestations are likely to disappear.

The treatment of hysteria should begin with a careful examination, especially in respect to the reproductive system. It should then be seen to that the patient has sufficient regular occupation of a practical nature, in household industries, for instance, or in the care of garden and flower-beds and other rural occupations, or in gymnastic exercises, swimming, skating, and the like. Beside this some tasteful employment of great interest to the patient is to be desired, such as singing, piano-playing, or painting. In this respect sketching in the open air is to be preferred. It is very desirable that the diet should be such as to furnish abundant nutriment to the nervous system, without overtaxing the digestive organs.

#### EPILEPSY AND ST. VITUS'S DANCE.

Among essentially spasmodic diseases those of most frequent occurrence are epilepsy and St. Vitus's dance. The treatment should aim to secure adequate rest, physical, mental, and sexual, to supply nutritious, easily digestible, but none the less enriching food, and to provide for the breathing of pure

air. The judicious employment of gymnastic exercises will be found an efficient aid in restoring the control of the will over the muscular system. Successful treatment should be followed by extensive rural excursions.

The diet of the epileptic must be of the simplest kind. Vegetable food is preferable. Many children never would become epileptics but for injudicious indulgence in animal food. The greatest care must be paid, not only to diet, but to the general habits of the patient. Over-exercise, especially after eating, long continuance in a hot place or at a high altitude, excitement, over-study, and all other agencies which favor cerebral congestion are to be avoided.

Often an epileptic seizure is ushered in by the utterance of a peculiar, sharp cry, as the individual falls. Immediately froth exudes from the mouth, sometimes froth tinged with blood. All that can be done for the relief of the patient is to keep him from injuring himself or others during the violent convulsive movements by removing him to some clear space, where there is nothing to strike against. No attempt should be made to hold even the limbs, but everything should be loosened about the throat and chest. A cork or some other hard substance should be placed between the teeth to prevent biting the lips and tongue. In the meanwhile no crowd must be allowed to gather about the spot. This is a very im-

portant measure of assistance in convulsions, as it is in every other emergency.

Persons subject to epileptic convulsions should never be permitted to go from home without a strip, containing the name of the individual, residence and the name of his disease, being attached inside the coat, where it will at once be seen upon opening the clothing. It will frequently afford desired relief, if those who are afflicted with spasmodic or painful diseases would form the habit of carrying a bottle of chloroform, to be applied to the nostrils at the first intimation of a spasm. None but a physician, however, should be permitted to hold chloroform to the nose of another person.

**Convulsions** in children may sometimes be relieved, in advance of the doctor's arrival, by the administration of a mild purgative in the form of an enema of warm soap-suds and castor-oil, or of a tea-spoonful of glycerine introduced into the lower bowel. In many cases benefit is experienced from the use of a hot bath or of a mustard bath, cold applications being made at the same time to the head.

## INSOMNIA.

Insomnia always proceeds from irritation of the sensory nerves, whether such irritation is psychical in character, such as severe emotional disturbances,

strong mental exertion, and severe pain ; or whether physical irritation arises from disordered blood, from fever, from intoxication, from consumption at a late hour of tea, coffee, and wine, from tobacco-smoking, from the abuse of narcotics, from itching diseases of the skin, from coughing, from heart palpitation, or from shortness of breath. The treatment of insomnia, whether it occurs independently, or is dependent upon some other condition, must be directed mainly to avoidance of the causes enumerated ; consequently careful attention must be paid to securing mental and bodily quiet, to employing the mind, and to the judicious regulation of all physical and mental activities. For instance, no indulgence of passion should be allowed just before retiring, and at this hour even chess and card-playing should be eschewed. The head must never be covered by the bed-clothing. Wall-papers ought not to contain arsenic. The sleeping-room should be cool and airy, the bed warm, and the light should be extinguished on retiring. Frequently, before going to bed, it is serviceable to employ derivatives, such as foot-baths, mustard poultices to the calves, and enemata. For the old and feeble a glass of strong beer or of old wine drank just before retiring is sometimes of great service. Younger persons, who are inclined to palpitation of the heart, may experience a like benefit from bathing the upper portion of the body

and drinking a glass of cool water which contains some effervescent powder. Not only is even a small quantity of beer a good soporific, especially for those unaccustomed to it, but an equally good effect can often be produced by laying the head upon a pillow filled with hops. Counting is an artificial method sometimes successful in inducing sleep, and so with some is reading in bed. No resort should ever be taken to drugs for this purpose, unless by order of a physician.

Insomnia is not infrequently associated with dyspepsia and other debilitated conditions. Persons so troubled are to be instructed to eat something before going to bed, having put aside work entirely at least an hour before. If not hungry, they should simply be told to eat, and if hungry, they should eat whatever they want. In a short time the night appetite will grow. Before eating a bath should be taken. Cool baths are preferable, given with a sponge or stiff brush, the body being well dried with a coarse towel afterward. After the bathing and rubbing, or after eating, a moderate amount of out-door exercise should be taken, or in winter, a few minutes with Indian clubs or dumb-bells. Farther than this, the individual should go to bed at the same hour every night, and arise at the same hour every morning. Good digestion and regularity of the bowels are of no small importance in point of undisturbed repose.

## DISEASES OF ALTERED NUTRITION.

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### ANÆMIA AND CHLOROSIS.

A substantial, light diet, and a healthy way of living are important factors in dealing with anæmia and chlorosis, for in these diseases, as in all the others of their class, the origin of the difficulty lies in a disproportion between the consumption and renewal of the blood—a fluid indispensable to life, since it nourishes all parts of the body and forms the source of bodily warmth. Anæmia is followed by a variety of ills, such as faintness, failure of strength, chills, dryness of the skin, palpitation, fragility of the blood-vessels, causing nasal and other hemorrhages, migraine, pains of different sorts in the back and in the nervous centres, even St. Vitus's dance, epilepsy, hysteria, melancholia, sensory disturbances, and fainting. Among the exciting causes may be enumerated deficient supply of food, want of light and air, excess or deficiency of bodily exercise, hemorrhages, pathological growths and discharges, dyspepsia. All of these conditions furnish individual indications in regard to treatment.

Anæmic persons are to be advised to abstain from cold baths and douches, as being too severe irritants ; and for a similar reason strong coffee and tea are to be interdicted. On the other hand warm and luke-warm baths may be recommended. Soup is better eaten at the end of a meal, for when taken at the beginning, it appeases hunger too quickly. The rule should be to eat frequently, but not too generously.

### DROPSY.

Dropsy is never an independent disease, but only a symptom of disease, and generally a later symptom which may accompany disease of the most dissimilar organs, including the heart, the lungs, the kidneys, the liver, and the blood. Consequently it is plain that each individual case of dropsy requires special consideration, according to the disease upon which it depends, and that a physician is never justified in regarding it as a primary affection. Any considerable accumulation of water, resulting from the transudation of blood thinned by impaired nutrition, inevitably occasions inconvenience and systemic disturbances. Minor swellings of this description occur often in the face and feet. The cure of a swollen face may be assisted by means of warm applications. Good service may be rendered, in case of

swollen feet, by wearing elastic stockings, or by bandaging the feet and ankles with bandages of rubber, flannel, or linen. Prolonged standing must be shunned so far as possible, and when reclining the feet should be elevated. Inasmuch as dropsy is a sequence of bad nutrition and bad circulation, it is advisable to adhere, when nothing interdicts, to a substantial and strengthening diet.

## OBESITY.

Obesity is a frequent affliction of persons in middle life, especially of those who live quietly and comfortably. Such individuals are very apt to find themselves increasing in flesh until they become corpulent. With those who live in complete idleness there is but little disposition to the accumulation of fat, because in such cases both appetite and digestion are deficient; but where these functions are sustained by however slight an exertion, some tendency at least exists to the gathering of fat. Obesity, when it appears, not rapidly, but gradually, presents no serious aspect. But in some individuals there seems to exist a personal, or even a hereditary tendency to corpulence, and then it not only gives to the body an uncomely appearance, but may also become the occasion of inconvenience and

even of dangers, as when it leads to apoplexy. In corpulent persons respiration and the action of the heart are likely to become impaired. This impairment is to be attributed partly to the lessened energy and the feebler contractile force of a heart which beats but faintly, partly also to the existence of a relatively large quantity of blood and to the pressure of surrounding organs. The same pressure of surrounding masses of fat interferes both with respiration and with the beating of the heart. For, upon their part, the muscles of respiration, filled with fat and encased in it, become, through the consequent diminution of their contractile power, less capable of fulfilling their function, so that the respiratory or heat-producing mechanism of a corpulent man encounters the same difficulties as a stove overloaded with fuel. Quite as objectionable is it, however, to be deficient in flesh, for such individuals have too little heat-producing material, and the processes of life consume the nitrogenous substances of the weakened muscular system instead of the fatty matters which are their normal pabulum.

A corpulent man, if he wishes to become healthy and well-proportioned, must not only rid himself of his superfluous fat, but must also avoid any farther accumulation of fat. This change, however, should take place only gradually : otherwise the health suffers. When any one seeks to give up fatty

foods too rapidly, he is apt to suffer many inconveniences, and especially to be troubled with those ugly wrinkles of the skin which mark the devotees of the Banting flesh-cure.

A fleshy man should abstain from eating largely of any fat article, of butter, sugar, confections, potatoes, bread, the yolk of eggs, or the marrow of bones. Furthermore, he must not drink much water ; in the first place, because this interferes with the circulation and with the heart's contractions by increasing the amount of material in circulation and so dilating the blood-vessels ; in the second place, because an increase in the amount of water consumed means a greater dilution of the food taken into the stomach and consequently a more thorough digestion, whereas it is politic for a corpulent person to impose restraints upon the amount he digests, although not upon the satisfaction of moderate hunger. It is better to drink after the digestive process is completed. If a stout person has a strong stomach, and can be satisfied with few meals, it is better for him, without decreasing his daily quantity of food, to limit himself to as few meals as possible, and even, it may be, to only two in the day : in this way he will digest less. A thin man, of course, must do the opposite.

Bodily rest favors corpulence to a marked degree, particularly when accompanied by rest of the mind and emotions, and it is therefore to be shunned by

fleshy persons. Personal activity should be increased by degrees, and at length the ponderous athlete should become able to walk long distances, to climb high mountains, should exercise in the gymnasium, should swim and skate, should play games in the open air, should dance out of doors, should saw wood, or work in the garden. He should not stop here, however, for that would only increase the tendency to corpulence, as we sometimes see in the instance of mechanics or laborers whose circumstances enable them to give up work. Lifelong exertion alone can be depended upon to keep down the inclination to fleshiness. In corpulent persons the question is properly not one of eating, but of exercise. In most cases the individual does not eat too much, but works too little. Just as sensitiveness to cold may be diminished by abundant and frequent eating, so the practice of moderation in eating is capable of diminishing, if not of wholly dispelling, the oppressiveness of a close atmosphere and of the perspiration it induces. This is a rule to be remembered in winter as well as in summer.

### APOPLEXY.

Apoplexy is the sudden and wholly unexpected bursting of a blood-vessel and the resulting escape of blood into the brain, as a consequence of which

either immediate death occurs, or loss of consciousness followed by paralysis of one side of the body. Such an occurrence is usually fatal after a few hours or days. The patient may, however, return to consciousness, and even by degrees to the power of movement. After the reappearance of consciousness the one-sided paralysis very generally remains during the remainder of life. In certain cases mental activity returns only to a limited degree, and then sluggishness of intellect, imbecility, even childishness are the results.

No warning is given of the onset of apoplexy. The symptoms and the consequences of cerebral hemorrhage depend upon the quantity of blood extravasated, upon the condition and conformation of the brain-substance according to the region into which the hemorrhage occurs, and upon the changes which the blood-clot undergoes. When only a few small blood-vessels are torn, and the amount of blood which exudes is small, so that the fibres and cells of the brain suffer only slight pressure, the loss of consciousness and paralysis are also slight and soon disappear when the blood is reabsorbed. When extensive hemorrhage occurs the brain substance is crushed and torn, so that immediate death is the more usual sequence ; but, when not, at least extensive and permanent paralysis ensues. From this it is evident that the results of apoplexy cannot be predicted.

No particular bodily development is more liable than another to apoplexy. There is no so-called "apoplectic habit." We know, however, that elderly persons with rigid blood-vessels are especially subject to apoplexy, as are those who rapidly become corpulent, and chiefly so when much blood has accumulated in the brain. Consequently such accumulations must be prevented. The existence of unnaturally rigid and brittle vessels can be detected by feeling the temporal artery, which runs upward over the head in front of the ear, and which under these circumstances is always found to be rigid and tortuous. By such individuals, as well as by those who are corpulent, everything must be avoided which may impede the return of the blood from the brain to the neck and chest. Among hurtful influences we may enumerate tight clothing about the throat and chest, coughing, fatiguing and continuous singing, shouting, blowing wind-instruments, continued bending, lifting heavy objects, constipation, straining at stool or in vomiting, flatulence, such severe physical exertions as running, dancing, and swimming. Similarly everything should be avoided which tends to drive the blood to the head, to stimulate the brain, or to produce palpitation of the heart. The latter category includes excessive indulgence in spirits, strong coffee, or tea, overloading of the stomach, great excitements of any description, ex-

cessive mental or bodily effort, exposure to extreme heat or cold.

When any one is attacked by apoplexy, every article of clothing should be loosened which constricts him even in the slightest degree ; he should be placed in a comfortable position, rather sitting than reclining, with his head raised and uncovered and his feet hanging down ; and the air of the room should be kept clear and cool, while special attention is paid to raising the temperature of his feet and lowering that of his head, meanwhile averting every disturbance.

## GOUT.

Gout is a disease dependent upon the accumulation in the system of uric acid, one of the excretory products of which the kidneys are charged with ridding us. As a rule those only are attacked by it who are given to indulgence in rich foods or in malt and fermented liquors. Accordingly its severity may be moderated by careful attention to diet. "A mixed diet is best—a diet containing a minimum of fatty matter, and in which the proportion of albuminoids, especially of meat, is regulated in each individual case with due regard to constitutional strength, digestive power, occupation, etc. As a

general rule, gouty persons should only eat meat once a day, at their chief meal. Smoked and salt meat and fish, pork, cheese, farinaceous compounds containing much oily matter and highly spiced—indeed, all culinary delicacies—should be absolutely forbidden. Eggs and dishes containing them should be avoided as much as possible ; the yolk must be considered particularly noxious, owing to the quantity of oily matter it contains. On the other hand, all kinds of soup, the more delicate varieties of meat, fish, shell-fish (oysters) in moderation, fresh vegetables, and fruit, may be recommended.

“Tea and coffee should be altogether abjured, or, when the patient cannot bring himself to do this, should be taken very weak. Alcoholic liquors should never be taken to quench thirst, but only as roborants, when they are really needed ; the best form is then a good red wine, neat or diluted with water, or else a light beer brewed with a small proportion of hops ; the fiery southern wines, and those which are acidulous, champagne, and heavy beer (porter, etc.), must be forbidden.”

“Next in importance to diet as a hygienic regulation in the management of gouty patients,” writes Dr. W. H. Draper, of New York, “is enforced exercise. The axiom of Abernethy, ‘to live on a shilling a day, and earn it,’ comprises the philosophy of the true relation of food to work, and of both to the

highest development of physical health. Exercise is to be enforced not simply as a means of securing an active respiration, and thereby an abundant supply of oxygen, but also as a means of converting the potential energy of the food consumed into vital energy. In persons who are incapacitated by neurasthenia (nervous prostration) or by excessive corpulence, the result of long indulgence in indolent and luxurious habits, it may be necessary to resort to passive exercise by rubbing, massage, and electrical excitation in order to secure the good effects of voluntary work.

"Another hygienic regulation of great value in the treatment of gouty discrasia is the promotion by bathing and friction of the eliminative function of the skin."

## RHEUMATISM.

Rheumatism is a disease which easily recurs, which is characterized by the frequent migration of its manifestations from one portion of the body to another, and which is attended by exquisite pain. Its treatment calls first for confinement to bed in a warm room, for the drinking of hot water or tea, and for warm wrappings to induce perspiration. The diseased portion should furthermore be encased in

hot poultices, moist or dry. In spite of this preliminary treatment, however, the precaution of summoning a physician ought never to be omitted, for rheumatism is a very capricious and exhausting disease, and its extension to nobler organs, and even to the heart, is always to be dreaded.

"Occupations involving muscular fatigue or exposure to sudden and extreme changes of temperature, especially during active bodily exertion, predispose to acute articular rheumatism ; hence its frequency amongst cooks, maid-servants, washer-women, smiths, coachmen, bakers, soldiers, sailors, and laborers generally. There is some basis for the opinion that residence in damp, cold dwellings predisposes somewhat to rheumatism.

"Some relief may be afforded by raising the affected limb and putting it in such a position as to reduce the afflux of blood and to relax the tendons and ligaments to their utmost. That holds good for the acute and very painful form, while in the less painful, that is in the chronic form, gymnastics with the affected part, massage, and other exercise render good service. Lemon juice abundantly partaken of mitigates the fever and shortens the average duration of the disease."

In this country a manifestation of malarial disease not infrequently takes the form of rheumatic symptoms, a fact which explains the numerous in-

stances in which the former disease is found to yield to anti-rheumatic remedies. Rheumatism may be prevented by a dry house and dry clothing. When clothing becomes damp, it should not be dried upon the person, but should be changed. Woolen under-wear, so long as it remains dry and clean, affords better protection than any other kind.

## TUBERCULOSIS.

Tuberculosis or "consumption" may occur in almost any organ. It results from a disproportion between the acquisition and the loss of material. Accordingly the treatment should aim to compensate the tissue waste by supplying new material for tissue building. This may be best accomplished by the aid of a substantial, easily-digestible diet, good air, and abundant rest for body, mind, and emotions. The diet should include a good deal of milk, eggs, roast meat, and other nutritive and strengthening foods.

## DISEASES OF THE RESPIRATORY TRACT.

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### COUGH.

Cough is not a disease in itself, but only a symptom which is found to occur in very many ailments. The location of the irritation which gives rise to a cough may be anywhere in the respiratory tract, in the larynx, for instance, the trachea, or the bronchi, and its occasion may reside in any irritating substance, such as dust, smoke, gas, liquid, a foreign body, or some inflammatory or ulcerative process. When produced by sharp food, the first seat of irritation is in the pharynx, and the irritation may extend, through the agency of the nerves, to adjoining portions of the respiratory tract.

Not everyone who coughs has consumption. Nevertheless, no one should let a cough go without attention, especially if it has persisted for some time. It is needless to say that a cough is most dangerous in small children, and that they should therefore be carefully guarded against it, and immediately relieved when attacked. The prevalence of coughs among children in general may be explained by the

coal gas and other impurities with which the atmosphere of dwellings is so commonly contaminated, as well as by many sudden changes of temperature; for our children are continually allowed to pass from warm, even from over-heated living-rooms into cold sleeping-rooms, from hot school-rooms into breezy courts, or from gymnasiums and dancing-halls, where they have been warmed through by exercise, into the windy streets. Grown persons too acquire coughs by going from uncomfortably warm houses, from close ball-rooms and theatres, often with their bodies perspiring, into the cold air where, it may be, a chilly wind is blowing. This change of air, however, is relatively less seldom to blame than the sources of irritation already referred to, and is chiefly used as a pretext by those who live irregularly and irrationally to conceal the disastrous effects of smoking, drinking, and other excesses.

In the inception of a cough one should diet himself strictly, eating no other condiment than salt, talking as little as possible, drinking no spirits, and using no vinegar. He should take a great deal of warm milk, very soft-boiled eggs, and honey. His dwelling-rooms should be kept well ventilated. During the day, but especially at night, he should breathe, in a moderately large room with closed windows and doors, an atmosphere impregnated with spirits of turpentine. Such an atmosphere may

be created by pouring half a tablespoonful of spirits of turpentine into a vessel of actively boiling water. In case of a child, or of a very irritable person, half this amount is sufficient. Direct inspiration of the turpentine is not necessary. It very seldom happens that an individual is markedly irritated by this quantity of turpentine. When such is the case, resort should be had to a large pine branch in a well ventilated room. If the cough persists, no delay should be suffered in calling a physician. A similar line of treatment holds good for sore throat and for nasal catarrh.

## PULMONARY CONSUMPTION.

The tendency to pulmonary consumption, or, in other words, to the reception and development of the bacillus which causes this disease, seems to depend in an especial manner upon the constant dampness of earth and air, and upon sudden, extreme, and frequent alterations of temperature. The regions where consumption does not occur are signalized by remarkable dryness. A dry, cold climate, or a temperate climate which possesses the quality of dryness, appears to give full protection against consumption, provided a substantial diet is supplied, a diet not lacking in heat-producing material; while

the tropics predispose to this disease, especially among natives of temperate countries. The processes of combustion and of tissue-change do not proceed rapidly in the lungs under tropical influences, but on the contrary a free tissue-waste takes place through the skin and urinary apparatus, while deficiency of appetite and digestive inertia are apt to interfere with the proper renewal of tissue.

An altitude of two thousand feet above the sea may be regarded in many localities as the limit for the occurrence of consumption. Consumption is found to bear a direct relation in the frequency of its inception to the density of population : hence its frequent occurrence in cities. Inheritance, or rather the tendency to inheritance, has been demonstrated in a large number of instances, and this tendency is chiefly from the father to the daughter and from the mother to the son.

It may be of service to republish here a part of the article by the present author, entitled "**The Most Important Antisepsis**," which appeared first in the *New York Medical Journal*, and which gives important points in regard to the treatment of consumption :

"The healthy human organism may within certain limits be considered an apparatus for self-disinfection. Innumerable quantities of germs surround, pervade, and pass through it without leaving any

appreciable trace of their contact. Fortunately, not all of these germs are virulent, many of them are innocuous, and even the dangerous ones vary in degree of harmfulness.

"In the light of recent bacteriological researches, we are justified in assuming that most of the constitutional diseases are due to infection by some characteristic bacillus, but it would be erroneous to infer that every one of these bacilli, by its invasion of the human system, in each individual case produced the characteristic systemic disturbance of which it is known to be the cause. Could all these invisible hordes of tormentors and slayers enter the system at the point of attack, then our populous cities would be but vast hospitals, and no single individual would reach the number of years which now constitute the prime of life.

"A healthy and well-nourished body is endowed with great powers of resistance to the action of most, if not of all, species of bacilli, thus rendering itself aseptic by virtue of its own healthfulness. A few references to actual experiments will suffice to show the correctness of this view. Professor Traube experimented in 1876 by injecting a quantity of pus into healthy dogs. After twenty-four hours he found no trace of it in the system; his results, however, were different when the quantity was increased. Dr. Trudeau inoculated fifteen rabbits with tubercle

bacilli ; ten of them, which were kept in damp, impure air and on improper food, developed tuberculosis. The other five were permitted to run about in good, pure air, and were well nourished ; of these, only one died of a resultant tubercular affection, and four remained well. The experiments of Brown-Séquard, which were made before those of Dr. Trudeau, yielded still better results, since of all the animals inoculated with the tubercular virus, not one was lost. He ascribed these results to their being kept in a well-aired open place, supplied with abundant nutriment.

"In patients who had only recently developed symptoms of phthisis, Brown-Séquard, Stokes, and Blake aborted the disease by the same treatment of saturating the system with pure air and good food. It must be apparent, therefore, that the power of self-disinfection depends chiefly upon two factors : 1. Thorough impregnation with the oxygen of the air. 2. Generous alimentation. These agents must be relied upon to give to the stomach power to digest certain bacilli, as well as to the blood that richness, vitality, and vigor which enable it to ward off an invasion of bacterial foes, and by the aid of which they can be most speedily repulsed and driven from the system, even though they have entered the circulation at a vulnerable spot. In addition to these two important factors, several other hygienic requi-

sites must not be overlooked, such as congenial temperature, sunshine, clean dry soil, pure water, moderate exercise, etc., all of which are valuable as accessories to produce the full beneficial effect of pure air and abundant food.

“The power of self-disinfection is greatly impaired whenever a serious illness, aggravated by febrile symptoms, takes possession of the body, but it is gradually restored when the illness subsides. Of all the duties of the physician, none is more important than to aid the prostrate organism in its struggle to recover the lost power of self-disinfection, not only by antiseptic chemicals, which are of excellent service wherever their application is admissible, but also by surcharging the system with pure air and nourishing food.”

The author's views are endorsed by a large number of medical authorities, as by Dr. Austin Flint, who says : “The dietetic instructions to a phthisical patient may be summed up as follows : eat of wholesome articles of food whatever the appetite may dictate ; endeavor to maintain and develop appetite and relish for food by the excitement of variety in kind and in preparation ; eat whenever hungry ; satisfy the appetite ; eat without any expectation of harm ; do not hastily attribute an indigestion to any particular articles of diet ; incur the risk of over-feeding rather than the greater evil of under-feeding.

"Outdoor life and exercise are of the greatest importance. Indoor life and sedentary habits, if not factors in an acquired cachexia, undoubtedly favor it. Students, clergymen, and men of leisure should systematically devote a fair proportion of time to exercise in the open air, and, as far as practicable, the exercise should involve recreation. It is needless to say that the importance of change is as applicable to women as to men. Caution is sometimes necessary not to carry muscular exercise to an injurious extreme. If carried to the extent of producing great fatigue or exhaustion, it is debilitating instead of invigorating. Exercise within doors, although much less useful than when taken in the open air, is nevertheless useful. Gymnastic exercises may be recommended when other measures which are to be preferred are not available. They are inferior to horseback-riding, hunting, mountain-climbing, etc. An increased expansion of the chest is apparently a desirable effect of exercise.

"Phthisical patients are no more—and perhaps less—liable to catch cold than persons in health. There is no ground for the great scrupulousness with which phthisical patients avoid the cold and night air, although out-of-door life in the daytime is to be preferred. Every practitioner has known of cases in which some remarkable changes of habits as regards out-of-door life and exercise have led to recovery,

such as performing long journeys on horseback or on foot, accompanying expeditions which involved camping in the open air.

“The supposed liability to, and danger of, catching cold often leads phthisical patients to wear an overplus of clothing. When they strip for an examination of the chest, not infrequently they remove two or three undershirts, a woolen or fur chest-protector, and sometimes in addition an oiled-silk jacket. The body is kept in constant perspiration by these articles. They occasion not only discomfort, but debility. A single word expresses the governing principle in clothing, namely, comfort. Articles of dress should be so adapted to the seasons and to changes of temperature as to secure comfort. This maxim applies to persons affected with phthisis as well as to those in health.

“The Prophylaxis against phthisis must date from birth. An infant should not nurse a mother who is consumptive, or whose milk is of poor quality. Care is to be observed in the selection of wet-nurses. All the various articles which are sold under the name of infants’ food should be discarded. Many of these are fraudulent; that is, they are not what they purport to be. There is need of much caution respecting the purity of milk, especially in cities. Much harm is not infrequently done by over-care in children’s diet—that is, by denying articles which they

crave, and restricting them to those which they do not like. Not infrequently, from undue caution the quantity of food is restricted, and children suffer from insufficient alimentation; this more likely to occur in our country among the wealthy than among the poorer classes.

"Occupying the same bed with phthisical patients and sleeping in the same room are objectionable. Care should be taken to exclude from the table the meat of tuberculous animals. In addition to the purity of milk in other regards, it should be ascertained that the supply is not from cows affected with tuberculous disease. The ventilation of apartments occupied by phthisical patients should be attended to with reference to the possibility of the disease being communicated by the inhalation of particles of tubercle; and it may not be a needless precaution to introduce a disinfectant into the vessels which receive the matter expectorated."

"The Health Department of New York City have formulated the following rules, based upon the conclusions arrived at by a committee of physicians and pathologists of that city: Pulmonary tuberculosis (consumption) is directly communicated from one person to another. The germ of the disease exists in the expectoration of persons afflicted with it. Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by

breathing air in which living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption contains these germs often in enormous numbers. This material when expectorated frequently lodges in places where it dries, as on the street, floors, carpets, handkerchiefs, etc. After drying in one way or another, it is very apt to become pulverized and float in the air as dust.

“By observing the following rules the danger of catching the disease will be reduced to a minimum:

“1. Do not permit persons suspected to have consumption to spit on the floor or on clothes unless the latter be immediately burned. The spittle of persons suspected to have consumption should be caught in earthen or glass dishes containing the following solution : corrosive sublimate, 1 part ; water, 1,000 parts.

“2. Do not sleep in a room occupied by a person suspected of having consumption. The living rooms of a consumptive patient should have as little furniture as practicable. Hangings should be especially avoided. The use of carpets, rugs, etc., ought always to be avoided.

“3. Do not fail to wash thoroughly the eating utensils of a person suspected of having consumption, as soon after eating as possible, using boiling water for the purpose.

"4. Do not mingle the unwashed clothing of consumptive patients with similar clothing of other persons.

"5. Do not fail to catch the bowel discharges of consumptive patients with diarrhœa in a vessel containing corrosive sublimate 1 part, water 1,000 parts.

"6. Do not fail to consult the family physician regarding the social relations of persons suffering from suspected consumption.

"7. Do not permit mothers suspected of having consumption to nurse their offspring.

"8. Household pets (animals or birds) are quite susceptible to tuberculosis; therefore do not expose them to persons afflicted with consumption; also, do not keep, but destroy at once, all household pets suspected of having consumption, otherwise they may give it to human beings.

"9. Do not fail to cleanse thoroughly the floors, walls, and ceilings of the living and sleeping-rooms of persons suffering from consumption at least once in two weeks."

To this we would add that it ought to be customary for all, and especially for the sick, instead of expectorating into the handkerchief, to make use of tissue-paper, which is to be carried constantly in a receptacle specially provided for the purpose, and which must be burned at a convenient opportunity. Positive instructions should be given to persons suf-

fering from cough never to swallow their expectorations, on account of the danger of self-infection producing tuberculosis of the intestines.

An undoubted method of contagion, and one to be discouraged under all circumstances, lies in kissing the lips of phthisical individuals.

The air breathed by a consumptive should always be pure and dry and should be free from irritating particles. Care should be taken not to constrict the lungs and chest either by wearing tight-fitting garments, or by bending forward when seated ; but on the contrary an effort should be made to secure the expansion of these organs by suitable gymnastics and other physical exercise. Such efforts at the expansion of the lungs must be undertaken, however, under many precautions and restrictions, and never under any circumstances when the patient is disposed to be feverish.

Recent investigations have demonstrated that the bacteria of consumption, like those of the malarial diseases, are especially numerous upon and within the ground, and that bad drainage is no unimportant factor in the production of the disease. An especial reason why no one should use uncooked milk is that it may be the carrier of consumption, as it is at present known to be of other grave diseases.

## CROUP AND DIPHTHERIA.

Croup and diphtheria are very dangerous diseases, whose proper seat is the pharynx, but which frequently show a marked tendency to invade the larynx. They are easily recognized by the grayish-white, mortar-like exudation which appears in patches upon a deeply congested mucous membrane. The more completely the mucous membrane of the mouth and throat have been subjected to the ravages of catarrh, so much the more readily will the contagion be received and diffused within it. On this account those who are affected with catarrh of the nose, mouth, or throat should take especial care against infection ; and for the same reason no diphtheritic patient should by any means allow his throat to be cauterized, for this injures the mucous membrane and spreads the germs of the disease.

Inasmuch as diphtheria is a very virulent disease, the utmost care should be taken in every instance to protect oneself against it. Whoever, for instance, needs to examine the throat of a diphtheritic patient - should close his own mouth tightly and stop his nostrils with cotton. After the inspection he should wash his hands with a solution of spirits of turpentine or of boracic acid. The sputum of the patient should be disinfected with scrupulous care. Drink-

ing-vessels, spoons and linen from the patient must not be used by healthy individuals. One of the greatest dangers of infection lies in kissing the patient, and this must be positively interdicted. Children should be removed from a house where diphtheria exists, or at least completely separated from their sick companions.

Tonsillitis, with great enlargement, and sometimes with induration of the tonsils, is attended by difficulty in breathing, by snoring, and at times by difficult hearing. The tonsils are apt to become permanently enlarged, especially after several recurrences. In this case a portion of each tonsil should be removed, an operation attended by little pain or inconvenience when a suitable instrument is used.

## ASTHMA.

Asthma is a difficulty in breathing, which comes on suddenly with convulsive respirations. In children, when not dependent upon some other disease, asthma consists apparently in a convulsive narrowing of the aperture between the vocal cords, a phenomenon not yet sufficiently explained by physicians. Such a condition should be treated by raising the child up, and sprinkling its chest and

back with cold water, rubbing the back, administering enemata of warm water and vinegar, rubbing and brushing the palms of the hands and the soles of the feet, by pushing one's finger far down the child's throat so as to cause coughing and vomiting, by inducing sneezing and exciting the sense of smell, and by plunging the child into a warm bath.

In adults asthma is as a rule a symptom which indicates an unnatural enlargement of the air-cells of the lungs. It may occur, however, as a nervous spasm of the bronchioles, and it even at times accompanies other lung diseases, some spasmodic nervous disease perhaps. In very fleshy persons, particularly among those who indulge in liquors, asthma seems to be dependent upon fatty deposits in the heart and respiratory muscles, and therefore treatment must be directed against obesity. Not infrequently too, in those affected with heart disease, consumption, spinal curvature, chlorosis, and similar diseases, the name, asthma, is applied to the attendant difficulty of breathing.

Nothing can give certainty as to the cause, when an asthmatic attack occurs or when great difficulty in breathing arises, excepting careful physical examination. In order to shorten an attack of asthma, after loosening all tight clothing, we may try sprinkling cold water upon the chest and back, tickling the throat to induce vomiting, inhalation of fresh

air, ether, or chloroform, the administration of chloral hydrate, the hypodermic injection of morphine, warm baths to hands and feet, the use of enemata, and friction upon the back. Sometimes the administration of fruit ices or of cracked ice does good service.

### HAY FEVER.

Hay fever is a catarrh of the respiratory tract, which is often attended by severe asthmatic symptoms, which seems to result from the irritation caused by the pollen of one or another plant, and which visits the individual only at the season of year when that particular plant is in flower. Ragweed is the familiar plant to whose influence the disease is most frequently ascribed in America, and as a consequence most hay fever sufferers are exempt, if they pass the period of attack in some region where this weed does not grow. Such localities are found in the White Mountains of New Hampshire, the lake region of Maine, in California, in Florida and parts of Georgia, in the copper region south of Lake Superior, and in most sections of Canada. In general an altitude of more than seven hundred feet secures exemption; but some patients are benefited only by a residence upon the seashore; and all are

free while upon the ocean, no doubt because the offending vegetation is necessarily far removed.

In the majority of cases this disease obstinately resists medical treatment. Much, however, may often be accomplished by way of palliation, and the treatment of other complaints exercises a beneficial influence upon hay fever. Regularity of life, plainness in diet, and especially the following of outdoor pursuits are of assistance in moderating the paroxysms. The severer symptoms may be relieved by such measures as are advised in case of asthma.

**Disagreeable Breath** is very often occasioned by uncleanly conditions of the mouth, due to the presence of particles of food between the teeth or in cavities of the teeth themselves. Hollow teeth should be frequently cleaned and filled by a dentist. The teeth should be carefully brushed every day, and especially after the last meal of the day, with alcohol or cologne when possible, or with a rosewater solution of permanganate of potash, or a solution of half a teaspoonful of spirits of turpentine in a glass of water. The snuffing up of such a solution may also be found serviceable against bad odors from the nose.

# DISEASES OF THE DIGESTIVE TRACT.

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## DYSPEPSIA.

Dyspepsia signifies difficult digestion. When a disturbance of digestion occurs, either as a result of general weakness, or in consequence of a catarrhal condition of the stomach induced by eating food too cold or too hot, by alcohol, by spices, or by decaying food, we know that the formation of pepsin is in some way interfered with. In such cases, since the efficiency of digestion depends largely upon the abundance of pepsin, it is desirable to administer artificial pepsin. When the indigestion is of recent origin, it is oftentimes sufficient to evacuate an over-loaded stomach by vomiting. If, however, the food eaten has already passed into the intestine, a laxative should be given.

A symptom which accompanies dyspepsia in the majority of instances is heartburn, with which is commonly associated a spasmodic sensation at the pit of the stomach, attended with the vomiting of water. In most instances, too, eructations take place frequently of a clear, watery fluid, having a sour or

rancid taste. Among the causes to which heartburn may be due are the use of fatty and rancid articles of food, the eating of foods that are sour or that readily turn sour, the presence of stomach affections with increased secretion of acid gastric juice, the formation of lactic and butyric acids in the stomach by an abnormal transformation of starchy elements, and, first perhaps in frequency, chronic catarrh of the gastric mucous membrane in drunkards. For the relief of this distressing symptom treatment must in the first place be directed to the neutralization of the acid by giving after each meal a pinch of magnesia or of bicarbonate of soda, and in the second place to the improvement of the mucous membrane of the stomach by means of strict diet and by drinking half a glass of hot water before each meal. The principal object of treatment is not simply to carefully eschew every indigestible substance, but, still farther, to avoid the causes of acidity and fermentation. Cold meats are generally found more easy of digestion than warm ones.

It may not be thought out of place to say here that many investigators of the present time hold the belief that intestinal fermentation produces certain chemical gases and alkaloids, which, when absorbed into the blood, make a profound impression upon the nervous system. It is maintained that their absorption practically introduces a poison into the blood,

followed by symptoms of disease which are vaguely attributed to various conditions. Brunton well said that "perhaps we are not yet sufficiently alive to the important results produced by the absorption from the intestinal canal of substances generated in it by fermentation or imperfect digestion. We recognize the danger of breathing gas from a sewer, but probably we do not sufficiently realize that noxious gases may be produced in the intestine, and, being absorbed into the circulation, may produce symptoms of poisoning."

"There is not a disturbed condition of life, extrinsic or intrinsic, that may not contribute to indigestion. In some cases it may be the effect of hot and enervating climates ; in others the alterations in the elementary constituents of the blood may be apparent ; while in still others the cause may be exhausting discharges, hemorrhages, profuse suppuration, venereal excesses, sedentary occupations, and long continued mental and moral emotions. The inordinate mental activity, the active competitions of life, the struggle for existence, the haste to get rich, the disappointments of failure—all contribute to this end. The general tendency of American life is also in the direction of a highly developed and morbidly nervous system, and functional dyspepsia is a natural sequence of this.

"Age also predisposes to weak digestion. The

stomach becomes weak as age advances in common with all the functions of the body, and consequent upon this weakness there is diminished excitability of the gastric nerves, with diminished muscular action of the walls of the stomach and deficient secretion of the gastric juice. Chronic structural changes are also apt to occur in advanced life.

"Anæmia is a common predisposing cause of indigestion. Indeed, as a widely prevailing pathological condition few causes stand out so prominent. It affects at once the great nutritive processes, and these in turn disturb the functional activity of all the organs of the body. Not only are the gastric and intestinal glands diminished in their functional activity by impoverished or altered blood, but the movements of the stomach are retarded by weakened muscular action. Nothing will more promptly restore the digestive capacity in such cases than good, healthy, well oxidized blood.

"Exhaustion of the nerves strongly predisposes to the atonic forms of dyspepsia. This form of indigestion is peculiar to the ill fed and badly nourished. It follows in the wake of privations and want, and is often seen in the peculiarly careworn and sallow classes. In this dyspepsia of exhaustion the solvent power of the stomach is so diminished that, if food is forced upon the patient, it is apt to be followed by flatulence, headache, uneasy or painful sensations

in the stomach, and sometimes by nausea and diarrhoea. It is best treated by improving in every possible way the general system of nutrition, and by adapting the food, both in quantity and quality, to the enfeebled condition of the digestive powers.

“ But of all predisposing causes of dyspepsia deficient gastric secretion, with resulting fermentation of food, is perhaps the most prevalent.

“ Of exciting causes errors of diet are amongst the most constantly operative, and of these errors excess of food is doubtless the most common and hurtful. The use of indigestible and unwholesome food entails somewhat the same consequences. This may consist in the use of food essentially unhealthy or indigestible, or made so by imperfect preparation. Certain substances taken as food cannot be dissolved by the gastric or intestinal secretions : the seeds, the skins and rinds of fruit, the husks of corn, and bran, and gristle, and elastic tissue, as well as hairs in animal food, are thrown off as they are swallowed, and, if taken in excess, they mechanically irritate the gastro-intestinal mucous membrane, and excite symptoms of acute dyspepsia, and not infrequently give rise to pains of a griping character accompanied by diarrhoea. The injurious consequences of overfeeding may finally correct themselves by destroying the capacity of the stomach to digest the food ; but on the other hand the weak stomach is

not infrequently made weaker by severely restricted regimen, and especially is this the case with mental workers. Men who toil with their brains rather than their muscles, whether dyspeptic or not, require good, easily digested, mixed diet.

“Haste in eating, with imperfect mastication, is a common cause of indigestion in this country. Mastication is the first step in the digestive process. It is important, therefore, that we have good teeth and that we take time to thoroughly masticate our food, for by so doing we prepare it for being acted upon by the juices of the stomach. Time is also necessary, in order that the salivary secretion may be incorporated with the alimentary substances. Haste in eating is one of the American vices. It grows out of the temperament of our people.” So says Dr. S. G. Armour.

“Irregularity in the intervals between meals, such as taking a meal only once in twenty-four hours, or taking food before the preceding supply has been digested, is another fruitful source of indigestion.

“To the most prominent causes of indigestion already alluded to may be added the habit of spirit drinking, especially the habit of taking alcohol undiluted on an empty stomach. All organs associated with each other in their physiological functions are apt to become associated in morbid action. And

first in the order of importance in such association is the liver. The pancreas is also closely associated with the stomach, and its secretion is of essential value in the digestive process.

“That morbid states of the intestinal tract occupy a prominent place in the etiology of dyspepsia is also a well-recognized clinical fact. Indeed, constipation of the bowels is an almost universal accompaniment of deranged digestion, and, when persistent for years, it is apt to lead to the most disastrous consequences.

“No single measure has such marked influence on the digestive powers of the stomach as systematic, well-regulated muscular exercise in the open air, and especially, if the exercise be accompanied by a cheerful mental state. For this reason outdoor sports are of benefit. This is often best accomplished by travel, when practicable, in foreign countries where everything will be novel and new and calculated to lead the patient away from himself. Get him to travel, says Watson, in search of his health, and the chances are in favor of his finding it. We have the authority of Sir James Johnson also for saying that no case of purely functional dyspepsia can resist a pedestrian tour over the Alps.”

**Spasm of the Stomach** is evinced by a pain, sometimes of one description, sometimes of another,

but always very severe, which frequently extends to the back, and which may occur either on an empty or on a full stomach. It is often attended or followed by an **Ulcer of the Stomach**, or is the consequence of the cicatrization of such a sore.

Diet is of the greatest importance. The patient should not partake of cold, irritating, distending, or indigestible foods or drinks, avoiding for instance iced water and beer, pepper, mustard, spirits, and vegetables. On the contrary we may recommend such aliments as milk, not sweet, but sour ; buttermilk ; palatable meatbroths, with an egg beaten in each cup, yolk and white together ; the juice of tender meat expressed with a lemon squeezer ; well-strained gruel, thin or thick, of oats, rice, or barley ; stale white bread or biscuits softened in coffee, tea, or chocolate ; the pancreas and brain of slaughtered animals. It is desirable to drink a glass of warm water several times a day.

## SEASICKNESS.

Seasickness is a disease of an extremely disagreeable and tormenting character, which completely stirs up the system, but which is at the same time nearly always free from danger. It owes its origin to the combined influence of various circum-

stances incident to a sea voyage, prominent among them the change of air and the oscillation of the vessel. The air between decks is especially prone to affect one unfavorably, and particularly in stormy weather, when the doors and ports (the windows of the vessel) are closed and the air is consequently contaminated by vapors arising from cooking, by the smell of the machinery, and by exhalations from human bodies, from the cargo, from the ropes, and from bilgewater. Moreover, even the pure external air, especially when the ship is rolling, is of a different density to the air on land, and may also produce the symptoms of seasickness. Just as the atmosphere in the high passes of the Cordilleras, the Himalayas, and other lofty mountains, in consequence of the reduced atmospheric pressure, occasions an alteration in the circulation of the blood, and consequently in the amount of nutriment furnished by the blood to the brain; so the air of the ocean, by virtue of its altered density, produces occasional irregularities in the circulation and thereby in the condition of the brain and other organs, causing headache, dizziness, nausea, and vomiting. Seasickness furthermore attacks the lower animals, as well as men, both upon the sea and upon high mountains.

The theory advanced in a paper on seasickness read before the Academy of Science in Vienna

several years ago, that the malady is due to the constant changes of equilibrium, has much in its favor, but at the same time we should not lose sight of the influence exercised by a change in the density of the air. The effect of sudden change of density may, for instance, be experienced in the quick movement of an elevator, which causes a sensation exactly like the early effects of slight seasickness. In a precisely similar way the atmospheric pressure is varied by the pitching and rolling of a vessel. The air may also be rarified by passing winds and by the current of air produced by the quick movement of the vessel. But at all times the air between decks is more dense than the outside air.

Perhaps the so-called **Caisson Disease**, described by Dr. Andrew H. Smith of New York, may be found to throw some light upon this subject, inasmuch as it has, up to a certain point, a similar etiology and similar symptoms to seasickness. Persons exposed for a considerable time to a greatly increased atmospheric pressure are liable, after the pressure is removed, to certain morbid effects, which comprise what is known as the caisson disease. It is observed principally in those employed in submarine operations by the aid of compressed air, and who labor for hours together in what is termed by engineers a caisson.

In Dr. Smith's view the explanation is to be found

in the altered condition of the circulation, which results first from increased pressure upon the surface of the body, and then from the sudden removal of that pressure. While the workman is in the caisson the blood is driven from the peripheral vessels toward the interior of the body, where the pressure is less than at the surface. If, now, the external pressure is suddenly removed, what will be the result? Vessels which have been compressed and almost emptied of blood will now offer new channels through which the blood can rush, and vessels overcrowded with blood will have the current within them slowed almost or quite to the point of stopping. The vessels of the brain and spinal cord, being within bony walls, where the direct pressure of condensed air could not affect them, will be found the most distended and the most helpless to relieve themselves.

A tendency to fullness of habit renders work in a compressed atmosphere much more hazardous. Persons of this build have more fluids in the body, the distribution of which is changed by atmospheric pressure in the manner before stated, and it is therefore not surprising that the effect upon them should be greater than upon lean and sinewy persons, whose bodies contain a minimum of fluid.

Starting from the theory already given as to the mode in which the disease is produced, Dr. Smith

was led to the idea that benefit would be derived from the use of an agent that would induce contraction of the capillaries, and thus correct the want of tone which was considered to lie at the foundation of the difficulty. For this purpose ergot was employed. The results justified the theory. Ergot was certainly very useful in a considerable number of cases, a fact which strengthens the belief that these symptoms are due, at least in part, to inequality of the systemic blood-circulation.

In persons suffering from seasickness the special senses and the power of imagination become greatly sharpened, particularly the senses of hearing and of smell. Not only the odor of food which we dislike, but even the mere fact of mentioning such food, causes or precipitates the outbreak of seasickness, and to listen to the vomiting of others is still more apt to cause an eruption. A person inclined to seasickness may be compared to a powder-room, which requires only a spark to cause an explosion.

Another occasion of seasickness is the intense oscillation of the vessel, in a mechanical way. As vomiting may be produced by a blow over the stomach, so the shaking up of the stomach produced by the motion of the vessel may also cause vomiting. Wherever the motion of the vessel is most violent and irregular seasickness appears in the most aggravated and cruel form, as, for instance, in the Bay of

Biscay, the Black Sea, the Baltic Sea, and the great lakes of North America, where direct and reflected waves rush from different directions. So, inasmuch as the largest amount of motion is experienced at the extreme ends of the vessel, it is there we find the greater number of victims.

No other organ of the body is subjected to such a wide range of reflected nervous disturbances as the stomach. Persons who have been subject to ailments of the digestive organs on land will be much more liable than others to suffer severely when at sea. Morbid sympathetic impressions are transmitted to the stomach mainly through branches of the vasomotor nerves from the semilunar ganglia of the abdomen, and through the pneumogastric nerve. Through this mechanism it happens that a pregnant uterus not unfrequently produces very troublesome vomiting while upon land, and that many women suffer during each menstrual period from nausea and indigestion. These troubles are apt to be greatly aggravated by their occurrence at sea. Such women should only commence a voyage after the menstrual period.

Congestions of all sorts should be guarded against, as they promote seasickness. Patients suffering from congestion of the liver are usually seasick during the whole time at sea, and the same is the case in the congestion due to pregnancy. In

pregnant women the spasms of the stomach are generally transferred to the uterus, and in most cases produce very satisfactory labor. An abortion may also be the result of such spasms. When the confinement has taken place, or menstruation ceases, seasickness generally disappears at once.

Since men and children are not so subject to congestions as women, they are less often attacked by seasickness, and when they do suffer, the attack is often less violent. Some people are much more liable to seasickness than others ; and, in fact, some seafaring men are seasick on every voyage. After living ashore for some time seamen are apt to be slightly seasick on going to sea again, and if the residence on land has lasted for several years, the attack will be much more severe. Many seamen, however, are never seasick, and cannot appreciate the sensation.

The stomach cannot be expected to bear too much, and therefore only the most digestible articles of food should be eaten at sea, and these not in too large quantities. After eating it is best to assume a recumbent position with the head elevated, either on deck or in the vestibule, where the air is pure and strong winds may be avoided. As long as a person feels well he should take plenty of exercise on the open deck. The bowels should be kept in good condition in order to promote proper circulation

of the blood, and to avoid congestions. When anyone is attacked by seasickness, he should observe the recumbent position, as above mentioned, taking special care to rest the head, as otherwise he will experience a disagreeable feeling of heaviness and a painful sensitiveness. The stomach should not be left entirely empty, but a moderate amount of food should be partaken of, as, although it may be rejected by the stomach, the spasms will be much less painful than when that organ is empty. Very simple foods are best, especially those of a sourish or sweet-sourish flavor, including fruits, especially grapes, grapejuice, fruit preserves, sourish soups, soft-boiled eggs, sauerkraut (better perhaps raw than cooked), and fine unadulterated dessert-wines in small quantity. On the other hand, other wines, as well as spirits and very sour and sharp foods, do not agree with the stomach. Gradually the convalescing patient may enrich his menu by the addition of pickled herrings, sardines, caviar, olives, cheese, and finally he will take his place at the common table without fear of impolite revelations.

No medicine so far tried has been found reliable. The best service has been rendered by the arsenical mineral waters, one or two glasses being drank during the day. When these are not obtainable, a few drops of Fowler's solution in a glass of water may be substituted. At times antipyrin, cerium, chloro-

form, ether, or sulfonal may be found of use. The author cannot refrain from giving his readers the benefit of the advice of several trustworthy ship's officers, who state that the administration of ten to twenty drops of kerosene oil on a lump of sugar, followed half an hour later by a cup of hot tea, will cure the most obstinate case of seasickness. The author is inclined to accept this prescription with some hesitation, as he is aware that ship's officers are often inveterate jokers. On the other hand, it must be admitted that the same statement has been made by the officers of different ships.

### ASIATIC CHOLERA.

Asiatic cholera is signalized by profuse and frequent watery discharges from the bowel. The attack is ushered in with symptoms more or less like ordinary diarrhoea. These soon become more urgent, and in a short time follow cramps and profuse evacuations of "rice water" liquid. The entire watery portion of the blood seems to be rapidly passing off in this form, leaving the blood viscid, darker in color, and lessened in quantity. The altered circulating fluid gives to the skin, particularly to that of the face, quite a dark color, and, naturally enough under the circumstances, also a shriveled look. As

is to be expected, the skin and the entire body moreover seem quite cold.

The appropriate treatment of cholera is similar to that to be employed in cases of dysentery, but includes in addition the administration of large quantities of hot fluids, especially of hot lemonade, for the purpose of keeping the blood thin. To these fluids may be added liberally rum, brandy, whiskey, and hot red wine. That no time may be lost in trying to arrest the evident tendency of the blood to seek the bowel, applications of heat must be employed in various forms with the object of diverting the circulation outward. Hot flannels, vessels of hot water, and stimulating applications may be diligently used upon the body and limbs, and friction applied by moving one's hands from the patient's extremities to his heart. It seems not impossible, furthermore, that fruits deprived of their skin and seeds, as well as other acid articles of food, especially lemons, may be found of great advantage in these cases, since the cholera bacillus is supposed to be active only in alkaline solutions.

Cholera is not nearly so fatal a disease as is generally believed. Many die of cholera, it is true, but because so many are attacked. It is well established now that the cholera germ is inimical only to certain persons whose stomachs are weak. It threatens danger, moreover, only when it flourishes in

the intestines. In a healthy stomach the germ will be destroyed by the digestive juices, so as not to pass to the intestine at all. As long as life remains there is hope in this affection, and people who were given up as dead have been known to rally and finally survive. In the fall cases of cholera not infrequently assume gradually a typhoid character, and the disease mostly disappears upon the accession of cold weather.

Cholera may be avoided by avoiding mental depression, want of cleanliness, dampness, over-crowding, and bad water, for these influences both invite the malady and increase its fatality. The cholera bacillus is best propagated in a moist atmosphere and in damp spots and damp clothing. Water of surface origin, never mind how far down the bottom of the well, or how unlikely to be contaminated by sewer gas and kindred emanations, should be carefully avoided when cholera prevails. Ordinary water may be boiled under cover for a few moments, to destroy the animal and vegetable life it contains. Filtering water does not necessarily purify it, but merely strains out particles too large to pass. What is left often constitutes the dangerous element. Heat destroys that.

Nothing likely to invite or force the blood to the mucous membrane may be permitted. Hence all indigestible articles and those difficult of digestion

must be eschewed. Warm food is to be preferred. Meals after fatigue, unless of easy digestion, must not be indulged in, and especial heed should be paid to the late meal of the day, when there is always less strength than earlier.

During an epidemic all intestinal affections assume the general features of the prominent disease, and it is noticed that when cholera prevails the most trifling irregularity in a greater or less degree assumes the well known symptoms of that disorder.

### DYSENTERY.

Dysentery is properly a disease of hot countries, where it often occurs as an epidemic ; but it is also encountered at times in more temperate climates. Sleeping in crowded dormitories, catching cold, getting wet, and errors in diet, are some of the causes which lead to the outbreak of this disease. Dysentery is a diphtheritic affection of the mucous membrane of the lower bowel, which takes at first a mild form, but which may quickly pass to a more serious condition. Its first appearance is marked by colicky pains with frequent and severe tenesmus and bloody diarrhoea. These may be followed by violent fever, coldness of the extremities, swelling of the abdomen, great debility, unconsciousness. Although

dysentery is probably no more communicable from one person to another than cholera, still it seems very apparent that it may be conveyed from the sick to the well through the medium of excrements, chamber-vessels, or syringes. It is therefore best, because safest, to avoid using these articles after they have been used by a sick person ; and it is also necessary to thoroughly disinfect the evacuations, and not throw them into the common closet. During the prevalence of an epidemic of dysentery all food and drink should be avoided which is likely to produce diarrhoea : on the other hand, food which is apt to produce constipation should just as carefully be refrained from, for this is equally likely to cause irritation and consequent diarrhoea. Catarrh of the stomach and intestines should be prevented as far as possible, and when it occurs should be promptly treated, for catarrhal mucous membranes are notably favorable to the reception of the dysenteric poison.

The treatment, not to speak of the use of drugs, should consist in the constant use of warm applications to the abdomen and the administration of enemata of warm demulcent substances, such as starch. The abdomen and feet must be kept warm. The bed should be firm and supplied with the necessary protectors : an extra bed is very desirable : a water-cushion is also to be recommended. In

order to replace the blood constituents which pass away with the evacuations, a sufficient quantity of warm, easily-digested food is required, in order that it may be absorbed by the stomach and upper intestine without irritating by its presence the diseased lower bowel. Such food is warm rice-water, warm barley-water, or beef-tea with an egg beaten in it. An excellent article of food may be prepared by enclosing a pint of ordinary wheat flour in a muslin bag and boiling it in water for ten or twelve hours : the external crust then being removed, the inner portion, which will be found to have undergone just the proper change, is to be mixed with hot milk to a gruel and cinnamon added. For some time after recovery only liquid food should be allowed the patient, and the abdomen should be protected by wearing flannel.

### SUMMER COMPLAINT.

Summer complaint is the name often given to an inflammation of the stomach and intestines, by which a large number of children are annually carried off, especially of those who are in their second summer. The great mortality of the disease is due partly to the disturbed condition of the digestive organs, which renders it impossible for them to sup-

ply the necessary amount of reconstructive material to the blood, partly also to the withdrawal from the blood, by reason of the diarrhœa, of a large amount of nutritive material. Sometimes the inflammation is confined to the intestines, and the disease is characterized by diarrhœa alone; in other cases the stomach only is affected, and then loss of appetite and vomiting are the result.

The closest attention in these cases must naturally be paid to correct nutrition. As a rule the first symptom of illness is the diarrhoea, which becomes rapidly more severe and the discharges more watery and colorless, while later on the complication of vomiting is added.

Warm flannels and other warm applications to the abdomen do excellent service in restraining the diarrhœa. From the appearance of the earliest symptom two or three teaspoonfuls of lime-water should be given every day in milk or beef-tea, and a small pinch of bismuth and magnesia after every meal. On account of the rapid progress made by this disease it is best to consult a physician upon the first appearance of bowel disorder.

"The fact is universally admitted, that the summer season, stated in a general way, is the cause of this diarrhœal epidemic. That atmospheric heat does not in itself cause the diarrhœa is evident from the fact that, in the rural districts there is the same

intensity of heat as in the cities, and yet the summer complaint does not occur. Observations show that the noxious effluvia with which the air becomes polluted under such circumstances constitute or contain the morbid agent."

An exception to this view of Dr. J. Lewis Smith is, however, to be made in regard to the direct sun-beams striking the child's unprotected head.

In this group are also wrongly classed those sudden and violent attacks in children, which in adults are known as **Sunstroke** or **Overheating**, and in which we find considerable disturbances of the brain, and also, by reflex action, disturbances of other organs, especially the abdominal and respiratory organs, besides faintness, depression, and loss of consciousness.

Mothers and nurses who accompany children upon day summer excursions, such as the trip by water from New York to Coney Island, should avoid exposing their charges to the sun's rays at midday. In heated weather it is best not to encourage the child to play in the surf, but rather to take it to a shady, breezy spot upon the pier, if one exists, and as far out toward the sea as possible.

The little patient who is affected by the heat should be placed in a cool situation, where uninterrupted ventilation may be had, and warm applications made to his abdomen, while ice or cold in some other form

is applied to the head. A teaspoonful of milk punch containing red pepper may be given every half hour. The most important measure, however, is to allow the patient to inhale from five to ten drops of chloroform sprinkled upon a handkerchief every five minutes until the symptoms are materially relieved.

Summer complaint is caused by overfeeding or by heat and bad air, never by teething. Dr. Ripley, of the New York Polyclinic, says: "Young turkeys and chickens suffer with the same symptoms during the summer, and are successfully treated by keeping them in a cooler atmosphere and looking carefully after their diet. As these fowls do not cut teeth, we may safely assert that teething cannot be held accountable for *their* 'troubles.'" Jacobi directs to "keep the door and windows open, and to wash the child with cold water at least twice a day, and oftener in very hot weather. If the child vomits and has diarrhoea, it should receive nothing to eat for four or six hours, but as much fresh air as possible. At the outset a few drops of whiskey or cognac may be given in a teaspoonful of ice-water every ten minutes, but not more until the doctor comes. As long as vomiting and diarrhoea persist neither should milk be given, nor opium nor any other sedative, nor tea."

Dr. Smith continues, "Every physician knows that the mode of feeding has much to do with the occurrence of summer complaint. A large propor-

tion of those who each summer fall victims to it would doubtless escape, if the feeding were exactly proper. The younger the infant, the less able is it to digest any other food than breast-milk, and the more liable is it therefore to suffer from diarrhoea, if bottle-fed. Feeding an infant in the hot months with indigestible and improper food, as fruits with seeds, or the ordinary table-food prepared in such a way that it overtaxes the digestive function of the infant, causes diarrhoea and not infrequently cholera infantum. Many obstinate cases of summer complaint begin to improve under change of diet, as by the substitution of one kind of milk for another, or the return of the infant to the breast after it has been temporarily withdrawn from it.

"Milk from cows stabled in the city or having a limited pasturage near the city, and fed upon a mixture of hay with garden and distillery products, the latter often largely predominating, is unsuitable. It is deficient in nutritive properties, prone to fermentation, and from microscopical and chemical examinations which have been made it appears that it often contains deleterious ingredients. If milk be obtained from distant farms, where pasturage is fresh and abundant—and in the large cities that is the usual source of the supply—considerable time elapses before it is served to customers, so that, particularly in the hot months of July and August, it frequently has

begun to undergo lactic-acid fermentation when the infants receive it. That dispensed to families in the morning is the milking of the previous morning and evening.

“**Cholera Infantum** is the most severe form of summer complaint. It receives the name which designates it from the violence of its symptoms, which closely resemble those of Asiatic cholera. It is, however, quite distinct from that disease. It is characterized by frequent stools, vomiting, great elevation of temperature, and rapid and great emaciation and loss of strength.

“Weaning just before or in the hot weather should, if possible, be avoided, and removal to the country should be recommended, especially for those who are deprived of the breast-milk during the age when such nutriment is required.

“It is also very important that the infant receive its food in proper quantity and at proper intervals, for, if the mother or nurse, in her anxiety to have it thrive, feed it too often or in too large quantity, the surplus food which it cannot digest, if not vomited, undergoes fermentation, and consequently becomes irritating to the gastro-intestinal surface. All physicians of experience agree in the propriety of sending infants affected with summer diarrhoea from large cities to localities in the country, which are free from malaria and sparsely inhabited, in order

that they may obtain the benefits of a purer air. Many are the instances each summer of infants removed to the country with intestinal inflammation, with features haggard and shrunken, with limbs shriveled and skin lying in folds, too weak to raise, vomiting nearly all the nutriment taken—presenting indeed an appearance seldom observed in any other disease, except in the last stages of phthisis—and returning in late autumn with the cheerfulness, vigor, and rotundity of health."

## CONSTIPATION.

Constipation, according to Dr. W. W. Johnston, of Washington, "occurs most frequently in advanced life. It is the effect of loss of peristaltic force and of diminution of sensibility in the lower bowel, and is associated with general functional inactivity and with muscular degeneration and obesity.

" Women are prone to constipation much more than men. False modesty, which imposes restraint upon young girls, and their ignorance of the necessity of regularity, their habits of indoor life, and avoidance of exercise, are largely the causes of this. Chlorosis and anæmia in girls are almost invariably associated with constipation.

"Persons of sedentary pursuits or who work in constrained attitudes—lawyers, clerks, tailors, shoemakers, and seamstresses—are predisposed to constipation.

"Resisting the desire to empty the bowel interrupts the necessary reflex acts, and finally the muscular excitability and response to the presence of feces are entirely wanting. The continued contact of fecal matter with the mucous membrane wears out its susceptibility ; the over-distension of the rectum enfeebles the power of its muscular wall. The use of aperients is an important agent in developing the constipated habit by over-stimulating and wearing out muscular activity. The idea that a daily movement is a necessity, and that an occasional purgative is useful in relieving the system of morbid matter which would otherwise induce disease, is the chief source of this hurtful custom. The traditional meaning attached to the term **Biliousness** implied the resort to cathartics for its relief. If the term 'bilious,' as applied to diseases, were abandoned, much good would come of it. The general use of purgative mineral waters has added to this evil. At first the injurious effects are not apparent, but in time the reflex function is not brought into activity except by artificial aids. The intestinal and rectal muscles must be whipped into action, their normal contractile power being lost.

“Chronic and serious diseases, by enfeebling the muscular movements which take part in defecation, as well as by the general feebleness and the chronic intestinal catarrh and indigestion which they create, are causes of constipation. Constipation accompanies obesity, for in very fat persons the abdominal walls have but little power of contraction ; the muscle-layer is thin and flaccid. The muscle of the bowel is in a state of fatty degeneration, and atony and dilatation of the gut follow.

“Loss of fluids by abundant perspiration, by diuresis, diabetes, and lactation, increases the dryness of the bowel contents and hinders free evacuation. This is observed as the result of the arrival in a tropical climate, and in very hot weather in any climate.

“An indigestible diet in excess, especially vegetable food, a large part of which is insoluble, constitutes by filling the bowel with matter which cannot be got rid of, and chronic catarrh results. The stones and seeds of fruits, as cherry and plum stones, raspberry and currant seeds, husks, corn, and oats, produce acute or chronic constipation with symptoms. Magnesia, insoluble pills, and other medicines sometimes form concretions in the bowel. Accidental concretions form in the intestinal canal and are sources of obstruction. Any foreign body is a nucleus, around which concentric layers of phos-

phate of lime are deposited, and thus a hard calculus is formed. Gallstones may pass into the canal and there accumulate in such numbers as to interfere with the passage of the fecal matter."

Long continued sluggishness of defecation may interfere with digestion, and consequently also with the formation of the blood and the nutrition of the body ; furthermore it may lead to disturbances of the portal circulation, to hemorrhoids, and to mental disturbances even. And yet help lies so near. The remedy may be found in the use of fruits, or of preserved rhubarb, or of prunes boiled with senna-leaves, or of decoction of tamarinds, or of eggs fried in castor-oil, or of castor-oil mingled with lemon-juice to improve its taste and effect, or of the fresh skin of an orange thoroughly masticated, or in the drinking of warm water or of Hungarian bitter-water.

"When it is desirable to empty the bowel in acute constipation a warm water enema for adults and children is the best means. The kneading of the muscles over the abdomen can be combined advantageously with an effort to accelerate the passage of the intestinal contents by manipulation in the direction of the movement. Drugs should be thought of last, not first. Infants and children especially should be cured of constipation without purgatives, if possible."

If the constipation returns easily, the abdomen

should be kneaded, rubbed, pressed, and otherwise manipulated, gymnastics and baths should be resorted to, and exercise should be taken frequently. One of the most reliable measures always is the administration of an enema of water alone, or of water with soap, salts, or oil.

When **Abdominal Pains** occur, especially if severe and attended by constipation, the possibility of a hernia must be remembered and a physician summoned at once. If vomiting is added, poisoning may be suspected. If the abdomen is swollen and the pain is increased by pressure, probably the peritoneum is in a state of inflammation, and the patient should be put to bed and warm fomentations continually applied—a treatment which proves of equal service when violent abdominal pains occur before or during menstruation. Rumbling, colicky pains, accompanied by diarrhoea or constipation, demand warm, demulcent enemata, warm applications to the abdomen, and carminative remedies, such as caraway-seed, aniseed, or fennel tea. If relief does not come quickly, a physician should be called at once, since internal strangulation or some other grave disease of the intestine may be found to exist.

**Flatulence** is occasioned by the gases generated in the stomach and intestinal canal. These gases are not abnormal, unless it be in quantity. They serve the purpose of forming an elastic air-cushion

within the abdominal cavity, and this, when compressed by the diaphragm and abdominal muscles, assists the established function of those muscles. Remedies for expelling the wind, for stimulating the intestinal movements, and for impeding decomposition may be found among the ethereal oily herbs, such as chamomile, fennel, anise, caraway, pepper, mint, calamus, valerian, and ginger, which should be given in warm decoctions or infusions. The gases may also be withdrawn by means of a rectal syringe having a long thin nozzle. The formation of intestinal gases may be prevented by restricting one's self to a suitable diet of light articles, in which the quantity of vegetable food, of fats, and of starchy and sweet substances is limited, and in which no husks are found. The abdominal muscles should be exercised by active movements and by massage, and care should be taken that the bowels move regularly.

## HEMORRHOIDS.

Hemorrhoids are engorgements of the veins of the rectum, due to arrested or impeded returning circulation, in like manner as in varicose veins of the leg. The most common cause is the so-called stagnation of the portal vein, to which reference has been

made in speaking of constipation. But retarded circulation may also be occasioned by chronic affections of the rectum, abdomen, liver, heart, and lungs. On this account it is useless to speak of special treatment (otherwise than surgical), because the root of the evil must first be cured; although local distress may be relieved by frequent bathing, by the application of cold water, and by the use of fresh tallow or salve. These annoyances may be avoided or at least diminished by keeping up a brisk circulation in the portal system. In order to accomplish this latter end the sufferer should take much exercise, especially in the open air, should eat and drink moderately and simply, should drink water copiously, should take care not to constrict his abdomen by unsuitable clothing or by leaning forward when seated, and should avoid intellectual and emotional excesses, for these, by weakening the general system, enfeeble the rectal veins and favor their engorgement. The ideal life may be best attained in summer, when all nature is at her brightest and gayest, and when serious employments may be left behind for a Bohemian existence in nature's wilds. When one's means do not permit this, he should perform suitable bodily work at home, should drink plenty of water, should bathe regularly, and should keep his bowels open with injections of warm water. Great caution must be observed about using strong purgatives, for these

are sure to do permanent injury to the stomach and intestines.

“The food must be moderate, unirritating, leaving but little fecal refuse, and its composition must as far as possible be of such a nature as to favor secretion and the peristaltic movement of the intestines, such as fruits and certain vegetables. Cold washing, clysters, and sitz-baths are also important remedies to keep the rectum and anus free and clean, and to prevent inflammation.”

## DISEASES OF THE URINARY TRACT.

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Diseases of the urinary apparatus are always to be regarded seriously. They may affect either the urethra, the bladder, the ureters, or even the kidneys. The diagnosis of these diseases requires in some instances the application of careful chemical and microscopical tests; in others the examination must be made according to surgical rules, and sometimes by the aid of the newly invented mirror for examining the bladder and urethra. Every sufferer from such complaints should therefore apply at the earliest opportunity to a competent physician.

**Spasm of the Bladder** is a violent contraction of the muscular wall of the bladder, accompanied by great pain and by strong and constant desire to urinate, along with actual inability to do so. The cause is in most cases a local one—some disease of the urinary or generative apparatus, stone in the bladder, acid urine. Pending the arrival of the doctor, treatment should be given by the prompt application of hot poultices or hot bathing over the bladder, and by the copious drinking of warm water and of thin linseed tea.

**Wetting the Bed** may be avoided by not allowing a child so troubled to drink at night. This may be rendered easier by also refusing food at night ; but an abundant supply, both of food and of drink, should be given some hours before bedtime, care being exercised that no indigestible articles are allowed. The child should not sleep upon a bed that is too soft and warm, nor should it lie upon its back ; and it should be waked once or more during the night to urinate.

## DISEASES OF THE SKIN.

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All unusual eruptions upon the skin should be seriously regarded, especially if they are symmetrical in their arrangement, or if sores appear upon the lower abdominal region. Such spots are often quite painless, and therefore their dangerous nature is less apt to be recognized.

**Eczema** is due to a deficiency in the secretion of the fat-glands of the skin, a condition which frequently results from excessive washing, especially in cold water. Manifestly such an influence acts much more readily upon a tender and vulnerable skin, but the eruption may develop after a time even upon the callous skin of those whose occupations expose them to much contact with water, notably upon the hands of washerwomen and bakers. Relief and protection may be secured by the application of linseed oil, glycerine, vaseline, and zinc salve.

**Blisters and Chafing-sores** develop upon surfaces which are continually brought into contact with one another in walking, or which are otherwise irritated by friction. The perspiration assists materially in their production. Powdered gum and rice-powder

are effective in healing them, but still more so is linseed oil, zinc salve, or powdered tannin.

**Corns and Frostbites** may be cured by applying a solution of equal parts of collodium, tincture of iodine, and castor-oil, or of the first two alone, or one of acetic acid. During the summer following the occurrence of a frostbite an effort should be made to contract the dilated bloodvessels of the affected region by painting it with furniture glue or with collodium. Corns may be prevented by avoiding shoes either too tight or too large, and by applying over any suspicious spot French adhesive plaster or the ordinary lead plaster, which must adhere closely and readily. Dark colored plasters are harmful on account of the rubber they contain.

For the annoying symptoms of **Chilblain** and of a similar condition which often extends into ulceration and sloughing, the most serviceable measures are to keep away from the fire, and, every night before retiring, to bathe the feet in cold water or to rub them with snow.

The disagreeable odor which sometimes arises from **Perspiring Feet** may be dispelled by sprinkling salicylic acid, tartaric acid, or tannin into the stockings. When a similar annoyance affects the axilla, an axillary pad should be worn, sprinkled with alum, tannin, or salicylic acid, or dipped in a solution of tartaric acid and then dried.

## PARASITES.

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Protection against **Scabies** may be secured by avoiding dirty beds when traveling, by refusing to sleep with strangers, and by shunning contact with old clothes, or, if these precautions prove impossible, by washing one's self with strongly smelling liniments, like camphor and spirits of turpentine, and with pungent soaps, such as that made from potash. The clothing of a patient troubled with scabies should be subjected to the dry heat of an oven, rubbed with spirits of turpentine or kerosene oil, and thoroughly washed with lye or soda.

The best applications to surfaces affected with scabies are spirits of turpentine, sulphur ointment, and balsam of Peru. Another substance worth recommending is kerosene oil, which renders good service also against fleas, lice, bedbugs, and other species of vermin, but care must be taken, on account of its irritating properties, not to leave it longer in contact with the skin than about a quarter of an hour.

The **Echinococcus** is a parasite found not infrequently within the bodies of dogs, and conveyed from them to man, especially when the dog is allowed to lick its master. These organisms develop within the alimentary canal, and particularly within the liver, less often in the kidneys. The gradual

destruction of the organ invaded frequently endangers life, unless the organ is freed of its colonists by exsection and removal of the affected parts. Protection against this parasite may be secured by avoiding intimate association with the canine species, and by seeing that such dogs as do approach us are kept thoroughly clean and well supplied with pure drinking water. Echinococci occur most frequently in Iceland, where dogs are wont to live in very intimate intercourse with men.

The existence of a **Tapeworm** can be positively asserted only when parts of it are known to have been passed. These parasites may be avoided by refusing meat that is raw or half-raw. For the removal of the worm a time must be chosen when segments have recently been passed. The cure must be accomplished rapidly by vigorous and persistent methods, before the worm has time to recover and form new adhesions. The latter happens when the head remains; therefore the cure is incomplete unless the head is passed. The head is the thinnest portion.

The **Trichina** is a species of parasite dangerous to life, which is acquired from raw or half-cooked pork, whether in the form of roasts, chops, sausages, or ham. Impunity against their ravages attends only thorough roasting, stewing, and boiling, for cooking for a sufficient period inevitably destroys the trichina.

## MOTHERHOOD.

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Menstruation is a physiological function distinctive of women who are capable of motherhood. Disturbances in this function are commonly, but mistakenly regarded as the cause of many forms of suffering. Quite the opposite is true. Diseased conditions frequently give rise to disturbances in menstruation, and therefore it is generally very unwise to attempt to restore interrupted menstruation forcibly by means of drugs. Many temporary indispositions, such especially as catching cold, digestive disturbances, great agitations of mind or body, notable increase or reduction in bodily temperature, and the effects of certain therapeutic measures, are capable, as well as numbers of graver diseases, of giving rise to deranged menstruation, or of causing its entire cessation.

When severe pains in the abdomen occur shortly before or at the beginning of the menstrual period, constituting the so-called menstrual colic, complete rest in the reclining position is to be sought, with very warm applications to the abdomen and warm

enemata. Excessive menstruation may be relieved in a measure by complete rest and the use of mustard foot baths. The diet of those who menstruate excessively should be very light, and hot drinks and condiments should be avoided. No accumulation in the bowels should be permitted.

It would be far better for American girls and women, if they followed the German custom of rest and seclusion during the menstrual week, even though that period may bring them no inconveniences. At this time the eyesight is especially liable to imperfections, and school-girls should, therefore, be restrained temporarily from mental work.

It is only during its later months that the existence of **Pregnancy** can be ascertained with certainty from the movements and the heartsounds of the embryo. At an earlier period it is rendered probable by the omission of the periods, by the occurrence of digestive disturbances, such as nausea and vomiting, by the appearance of a variety of strange cravings, by unusual paleness, and by enlargement and hardening of the breasts, with pigmentation of the nipple areas.

Even before the child is born sacred duties toward her offspring devolve upon the mother. Inasmuch as the embryo requires, more than anything else, space in which to grow and develop, the mother's clothing should be free from constrictions, especially at the waist, but should fit snugly to her form and

should be capable of affording abundant warmth. In order that the embryo may thrive it must receive a sufficient supply of suitable nourishment. Since, however, its sustenance is derived from the mother's blood she should subsist upon a nourishing and easily digestible diet. Stimulating and heat-forming foods are to be interdicted, especially those which excite violent heart action, such as strong coffee and tea, spirituous liquors, and sharp spices; so too are indigestible foods and such as generate wind and stimulate micturition, as well as smoked, hard, and fat foods. But milk, eggs, meat, pastry, the plainer vegetables, fruit, and mild beer are articles to be advised. When necessary to regulate the action of the bowels, this should be done, not by drastic purgatives, but by means of warm or lukewarm enemata. The inclination to a passage should be immediately satisfied, never repressed.

Those who expect to become mothers must also avoid blows and pressure upon the abdomen, jumping, running, dancing, horse-back riding, lifting and carrying heavy weights, bending far over, crying, loud laughing, riding in an uncomfortable position, and all other considerable exertions. All strong emotions, anger, hate, grief, fear, envy, jealousy, exercise an immeasurably disastrous influence over both mother and embryo, while quietude of mind, good spirits, and self-satisfaction are of proportionate

benefit. The physical well-being of the mother is essentially promoted by daily but moderate exercise, both out of doors and in a well ventilated house, as well as by a sufficient amount of rest and sleep. The mother must not deceive herself with the idea that constant rest and inactivity are beneficial to her expected offspring. It is far better for a woman to perform light household duties, and to go out frequently. Long and frequent sleeping are also objectionable. Baths are indispensable to everyone, but especially to a pregnant woman.

The Lying-in room should be spacious, high, and free from dampness, and its atmosphere should be pure and comfortably warm. All necessary articles should be made ready beforehand.

The calling of the physician ought never to be left till the last moment. It is urgently to be advised that the patient should cause herself to be examined by her physician at intervals during the preceding weeks. Upon such occasions the most scrupulous care is to be expected of the physician in the disinfection of his hands.

Just as the general muscular system attains in different individuals a varying degree of development, so the womb, which is in reality only a muscle, shows different degrees of resistance in different women. There are healthy, strong races, such as the Montenegrins, the Albanese, the Kafirs, and

others, whose women are accustomed to resume their wonted occupations at the very latest upon the second or third day after delivery, a procedure which our city-bred ladies would be apt to find fatal. The power of resistance and the contractile energy possessed by the womb in many of our women is so feeble that the bloodvessels do not close properly after delivery, and their gaping exposes the patient to fatal hemorrhage. With such women parturition means an overexertion, and at its conclusion the contractile power of the womb is found to be exhausted, so that blood flows forth freely and in great abundance, while the germs of putrefaction and disease find ready entrance.

After the accomplishment of delivery the only attention required at first by the mother is that of ascertaining every few minutes that the discharge is not excessive and that the patient has sufficient covering. The remainder of the time under ordinary circumstances may be devoted to the child. When its crying demonstrates that the infant is not wanting in vitality, it may be at once washed, dried, and dressed. If it be feeble, and particularly if its respiration is shallow, it should be stimulated until it cries lustily. This may be done by plunging it alternately into tubs previously filled with warm and with cold water, by slapping it vigorously from time to time upon the buttocks, or, if other means fail, by pushing

a quill deep into its nostrils as a means of stimulating voluntary respiration. The simplest method of performing artificial respiration is that of inspiring and expiring air by contact of the nurse's mouth with that of the child. Another method, often found very efficient, is to bring the child's hands together as high as possible above its head by grasping them at the elbows, and to return them again through a full arc to their natural position beside the thighs, this movement being repeated about sixteen times a minute until natural respiration begins.

Some fifteen minutes or more after the birth of the child the principal attention may be turned again to the mother. The afterbirth should now be removed and from time to time a tablespoonful of some refreshing and strengthening fluid should be given the mother, attention still being paid at increasing intervals to the possibility of hemorrhage. Should bleeding become abundant, the drug prescribed by the physician and kept at hand for that purpose, should be at once administered. One or both hands may then be laid firmly flat upon the lower portion of the womb, stopping the bleeding in just the same way as when pressure is produced by a hand upon a wounded arm. The attention which it is necessary to pay to the question of possible hemorrhage in a parturient woman is all the more important inasmuch as she herself is nearly stupefied as a result

of her exhaustion and is not likely to perceive even copious bleeding. Hemorrhage is most apt to occur during the first hour after delivery, and this is the time when the doctor should not fail to be at hand to render assistance.

Some half hour or more after the removal of the afterbirth, provided no severe bleeding has occurred, the bedlinen should be changed, the region of the external organs being first cleansed, but these organs themselves not until the physician permits. The linen used should be new and perfectly clean, and it should be warmed before use, for the patient is almost sure to feel cold and require special attention to restore her bodily warmth. The ventilation of the room should not, however, be allowed to suffer for the sake of obtaining warmth. Ventilation should be accomplished, if possible, through an adjoining apartment.

For protection against the invasion of the germs of decomposition, and for the better removal of secretions which interfere with cleanliness, an ample quantity of loose iodoform gauze, oakum, or marine lint should be placed between the thighs several times a day so long as the patient remains in bed. The soiled material must be burned at once on removal.

The lying-in period requires complete rest, the utmost cleanliness, constant or very frequent change

of air, properly regulated diet, attention to the quantity of the perspiration and to the secretions. When possible, the child should be nursed by the mother herself. All mental disturbances are to be avoided, and all needless callers excluded. Sleep never must be disturbed without the most urgent necessity. The diet must be simple and of easy digestion. If the patient has no passage up to the second or third day, a dose of castor-oil or an enema of warm water should be given. A warm bedpan must invariably be employed. Strict cleanliness is to be observed in regard to the person and clothing of the patient, quite as much as in the room and bed.

**Sore Nipples** are a not infrequent malady of the lying-in period, and of the succeeding months of lactation. By way of protection against this affection we may recommend during pregnancy frequent washing of the nipple with medicated waters and alcoholic fluids, and free access of air; and during nursing the greatest cleanliness and protection of the nipple against pressure. The use of artificial nipples during the first four or five weeks is a good means of preventing the nipples from becoming sore. If even the slightest pain occurs while nursing, resort should be had at once to the nippleshield, so perhaps preventing a sore.

The best preventives of sore nipple are painting the dry, clean, nipple with collodion, nitrate of silver,

limewater, boracic acid, dilute spirits of turpentine, or almond oil. When the inflammation is severe, the sick child should not be allowed to nurse the diseased breast, but the milk should be removed by other and milder means. The constant drawing out of a sunken nipple during pregnancy, with the resulting anticipation of the milk secretion, seems capable of causing the death of the embryo. Painting an area around the nipple with collodion is recommended as a means of developing the nipple and drawing it out.

**Sore Eyes** in new-born children commonly result from discharges or other foreign matters which have gotten beneath the eyelids at the time of birth. Cleanliness is in this instance, as in so many others, the great preventative and curative. The eyes should be carefully washed out, as often as the child is bathed, with warm water in which a pinch of boracic acid has been dissolved. No violence should be used, and all light should be excluded by darkening the room. If these measures do not promptly allay the inflammation, a physician's advice should be sought, as a precaution against possible blindness.

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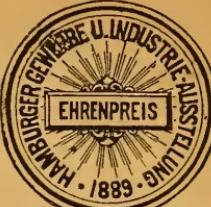
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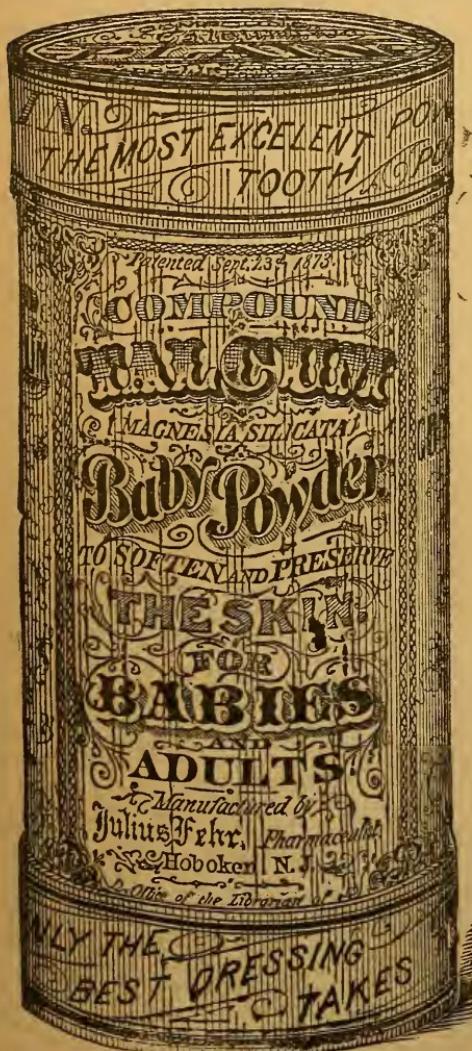
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